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BRIEFS

**AUTOMATIC GAS ANALYZER**--The designers of the Smolensk production association "Analitpribor" have developed an automatic gas analyzer "GAI-1". It is intended for the determination of the carbon monoxide content in exhaust gases and can be utilized in technical servicing stations for automobiles, in garages, and helps specialists of the state auto inspection in their work. The device is portable and twice as light as the analogue now being used. Serial production of the novelty has already begun. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 26 Oct 79 p 2] 8970

**NEW 'VOLGA' MODEL**--Yesterday state tests began on the automobile GAZ [Gor'kiy Automobile Plant]-3102 "Volga". In the morning a column of the light cars left the guarantee technical servicing station for cars of the GAZ and moved through the streets of Moscow. Passers-by looked with curiosity at the bright-blue car at the head. Made longer, a slightly sloped hood, elegant coating. . . And nevertheless it reminded one very much of the "Volga". And it was a "Volga"--the new model. . . This is how the test run began in which several GAZ-3102 cars are taking part. Their route is through the cities of Voronezh, Rostov-na-Donu, Tbilisi, Anapa, Feodosiya, Simferopol', and Khar'kov. The new "Volga", which has already successfully passed plant tests, must now prove itself in natural conditions. Ahead of it are level roads and mountain passes. . . The total distance of the journey is 6,000 kilometers. How does this car differ from the M-24 that is well-known to everyone? The designers paid attention, above all, to the increased safety of the automobile, according to the chief of the design group, commander of the run E. Klutsis. The seats, which have now become more comfortable, are equipped with head rests, the interior panel has acquired softness, and the steering wheel--a wide spoke. All this must protect the driver and passengers from possible shocks. The braking system has been significantly improved, and the wide-profile tires guarantee dependable stability. The motor also underwent design changes, its capacity now being 105 horsepower. This allows the development of speeds up to 150 kilometers per hour. But the main thing is a significant reduction in the number of harmful substances in the exhaust. The car test run is the first step in the state testing. After its return home, the new "Volga" must pass an examination on special routes: dirt roads, cobble-stone roads, and sandy roads. And then--a careful inspection of all joints and parts, and, finally, the assessment of the commission. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 24 Oct 79 p 4] 8970

**'ZHIGULI' SERVICE**--Yakutsk, 13 [Oct] (TASS)--A technical servicing station which has been placed into service in Mirnyy guarantees faultless service to Zhiguli owners in conditions of the Far North. More than 3 million "Zhiguli" cars now operate on the roads of the country. In order to help car lovers with the operation and repair of their cars, the AvtoBAZ [Belo-

russian Automobile Plant] has created and is developing a system of service. In the central oblasts of Russia, Kazakhstan, Siberia and other places, technical servicing stations are now operating. The "geography" of the car service is expanding. Technical servicing stations for the "Zhiguli" in Magadan and Magnitogorsk, on Sakhalin and in Vladivostok are becoming its new points. [Text] [Moscow PRAVDA in Russian 14 Oct 79 p 3] 8970

TRUCK TRAILER TRAINS--A column of MAZ [Minsk Automobile Plant]-6422 truck trailer trains in the northern execution has returned from a long test run to the Minsk Automobile Plant. The Minsk designers, in developing a new model, tried to give maximum consideration to those conditions in which the vehicles must operate in Siberia, in the North. For this reason, the MAZ models intended for use in these regions differ in many respects from their serial "brothers". Before putting the new model into assembly line production, it had to be carefully tested. The trailer trucks were loaded on railroad flatcars and sent to the Far East. For the development of the natural resources of Siberia, the North and the Far East, says the chief designer of the Belorussian Minsk Automobile Plant, USSR State Prize Laureate, Doctor of Technical Sciences, Prof M. Vysotskiy, reliable machines are needed. The large-scale freight trailer trucks MAZ-6422, which have returned from their test run, justified our hopes. The composition of the truck trailer train included a triaxial saddle towing unit and a triaxial container carrier-trailer. Load capacity-- 32 tons. The cabin of this machine has an autonomous heater which maintains room temperature here during any frost conditions. The panoramic windshield significantly increases the field of vision. The interior of the cabin is furnished with regard to the latest demands. The trips in the North and in Siberia, as a rule, last many days. And the driver, naturally, gets very tired on the way. The designers took this into consideration. In the cabins of the truck trailers two comfortable sleeping places are envisaged. The MAZ machines started their run from the Tynda region to the Yakutsk side. They went to Ust-Nera and from there moved to Magadan. This territory is rigorous, and its difficult character had to be tried out by the machines. The results of the tests confirmed the correctness of the basic design calculations. [Text] [Moscow IZVESTIYA in Russian 31 May 79 p 1] 8970

AGRICULTURAL TRANSPORT--The first machines with the State Emblem of Quality for the transport of agricultural cargo have been sent to the farms in the non-chernozem region by the collective of the Mytishchinskiy Machine Building Plant. These are the dump truck bearing the trade-mark ZIL-MMZ-554 M. The load capacity of the machines has been increased by 1½ tons. To expand the volume of light-weight agricultural loads, extension boards are envisaged in the complete unit. A system for the reliable sealing of the body has been developed. [Text] [Moscow IZVESTIYA in Russian 5 May 79 p 1] 8970

ELECTRONIC IGNITER--Ordinarily in the process of using an ignition system, the contacts of the interrupter burn, the spark plugs are covered up with carbon, the capacity of the accumulator falls. The electronic ignition block "Iskra-3" eliminates these troubles. It relieves, as it were, the contacts of the interrupter and increases the service life of spark plugs. As a result of the more complete burning of fuel the capacity and economy of the motor are increased and the toxicity of exhaust gases is lowered. The Iskra-3 block can be installed in any automobile with a 4-cylinder carburetor engine and guarantees a voltage on initial winding of the ignition of 360 volt. The minimum operating voltage is 6.5 volts. Price of the block: 42 rubles. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 July 79 p 4] 8970

HOT METAL TRUCK--Zaporozh'ye (Correspondent of the Ukrainian News Agency)--The first native motor metal transport on the basis of the large-scale load motor vehicle "BelAZ-531" and the K-700 tractor was created jointly by engineers of the Dneprospetsstal' Plant imeni A. N. Kuz'mina and the Belgorod Auto Repair Plant. The unit, which is intended for interplant transports in metallurgical enterprises, has a load capacity of 30 tons and is capable of conveying shaped rolled metal, ingots, billets, and containers. Given the appropriate reequipment, it can transport hot metal, managing without hoisting cranes. The use of motor metal trucks makes it possible to release more than 200 workers, a considerable number of diesel locomotives and railroad cars at Dneprospetsstal'. The economic effect amounts to 600,000 rubles annually. [Text] [Kiev RABOCHAYA GAZETA in Russian 5 Jun 79 p 1] 8970

AUTOMOBILE PRODUCTION PLANS--The plan for the current year provides for the output of 1,310,000 automobiles in our country. In addition, as the deputy head of the Planning and Economic Administration of the USSR Ministry of Automotive Industry Petr Petrovich Sklyarov reported in an interview with our correspondent, the collectives of the enterprises and associations of the ministry have accepted the social obligation to manufacture another 2,500 automobiles over and above the plan. Among the new models which, without a doubt, interest the rural automobile fans is the "Moskvich 21406". Its serial production began at the Moscow Automobile Plant imeni Leninskogo komsomola. This model differs from the preceding ones by its higher clearance--which is not unimportant in traveling on country roads, and also by its forced-down engine, which operates on A-76 gasoline. The engine power has been increased to 150 kilowatts. A car bearing the trademark VAZ-2121 "Niva" has become very popular among rural workers. This a comfortable fast automobile with a load capacity of 400 kilograms. The car has a powerful engine, excellent maneuverability, and high practicability. The production of the "Niva" this year will increase by more than 30 percent by comparison with last year. The growth in the number of automobile fans requires a decisive improvement in the technical servicing of automobiles, P. P. Sklyarov said further. The volume of services provided to the population by the enterprises of our ministry

will almost double this year by comparison with 1977. The number of automobiles which can be simultaneously turned in for repair--is more than 6,000. It is worth saying that this amounts to 46 percent of the total volume of automobile service in the country. [Text] [Moscow SOVETSKAYA TORGOVLYA in Russian 22 Mar 79 p 4] 8970

MORE EFFICIENT BUS--L'vov. The new LAZ-4202 bus uses less fuel and produces almost no air pollution through exhaust gases. Today the collective of the local bus plant began serial production of these buses. The new LAZ, calculated to hold 95 passengers, differs from earlier models both by the original form of its body, increased maneuverability and the facility of entry. The hydromechanical gear shift automatically shifts speeds, the modernized steering assembly significantly facilitates the work of the driver. The production of this bus for city routes is organized in new production grounds. In the current five-year-plan, a large building complex at the plant has been put into operation. [Text] [Baku VYSKA in Russian 7 Jul 79 p 1] 8970

AUTOMOBILE REPAIR FACILITY--The construction of yet another enterprise of the automotive industry has begun here. Upon attainment of design capacity, the plant will repair 100,000 engines produced by the Kama Automobile Plant. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 27 Apr 79 p 1] 8970

AXLE REPAIR--In the central design and technological office of the Uzavto-transtekhnika Scientific Production Association of the Ministry of Automotive Industry of the Uzbek Soviet Socialist Republic they have developed and introduced, in the automobile enterprise No 80, a stand for the replacement of the middle axle of the motor vehicle KRAZ [Kremenchug Automobile Plant] (Model SSM-1M). The introduction of the stand made it possible to replace the middle axle without removing the rear axle, to improve the conditions and raise the productivity of labor, and to reduce significantly the idle time of the automobile during repair. The conditional annual economic effect is 5,745 rubles. It is recommended for use in motor transport enterprises. [Text] [Tashkent PRAVDA VOSTOKA in Russian 18 May 79 p 3] 8970

NEW TRUCK FUEL--New cargo-carrying vehicles have appeared in Leningrad which use liquified gas instead of gasoline as fuel. Their engines are the same, some changes have been made only in their fuel apparatus. What are the advantages of the new type of fuel? The main advantage is--half the quantity of harmful substances in exhaust gases of such a vehicle. And the most toxic--the [?] part is reduced by almost 90 percent. Besides, for every 100 kilometers of travel of such a vehicle, 4 kilograms less fuel are required than gasoline. The use of gas fuel increases the engine power of the motor. A decision has been taken concerning the gradual transfer to gas of all trucks of the city. The capacity of the Leningrad interconnected facility for liquefied gas is being expanded by a factor of 7, mobile gas filling stations are being received,



soon the construction of stationary ones will be begun. [Text] [Tallin SOVETSKAYA ESTONIYA in Russian 5 Jun 79 p 3] 8970

FREIGHT-PASSENGER VEHICLE--At the Lutsk Automobile Plant of the Zaporzhets Production Association production has begun on a new freight-passenger mini-cross-country vehicle, "LuAZ-969M". In fully-equipped condition, this motor vehicle weighs less than a ton. In 1979 more than 11,000 units will be manufactured at the plant. Competing during the tests with the famous UAZ-469 cross-country vehicle, this small and nimble vehicle easily tore along over impassable roads, without any difficulties crossed river fords, dashingly climbed up the river bank, cautiously but very convincingly went down the slope of a ravine. This vehicle is basically intended for the use in rural localities. Its open, 2-door metal body with fold-back rear platform and a soft removable top accommodates simultaneously 4 passengers and 120 kilograms of freight. The capacity of the engine of the "LuAZ-969M" is 40 horse powers. It is laid out to the front and has its basic drive on the front axle. This increases the passability of the vehicle and its steadiness on steep surfaces. In difficult conditions of impassable roads the rear axle engages, which has a blocking of the differential. Still another peculiarity of the design of this vehicle: all of its wheels are equipped with reducing gears and have independent torsion suspension. It remains to be added that the mini cross-country vehicle can develop speeds up to 90 kilometers per hour. Even with a full load, this vehicle can tow a 300 kilogram trailer. [Text] [Moscow TRUD in Russian 15 Jul 79 p 2] 8970

CSO: 1821

## CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

### PROBLEMS, SOLUTIONS IN RURAL CONSTRUCTION

Moscow SEL'SKAYA ZHIZN' in Russian 27 Sep 79 p 2

[Article by Kh. Myand, deputy chairman of the republic association Estkolkhozstroy: "Improvement of Rural Construction: 'To the Last Detail!'" ]

[Text] When interkolkhoz construction organizations began to be created in Estonia, all farm managers hoped they would be freed of functions and concerns related to capital construction which were not really in their field. But though the system of interkolkhoz associations has become noticeably stronger and has become the principal contractor doing rural construction in Estonia, our cooperative members--and they have had and still have the last word in the system--have repeatedly expressed dissatisfaction with the performance of the building contractors, who still have not managed to relieve the client of all the concerns related to construction.

In the decree of the CPSU Central Committee and USSR Council of Ministers entitled "On Improvement of Planning and Enhancement of the Impact of the Economic System on Raising Production Efficiency and Improving the Quality of Performance" straightforward measures are envisaged to speed up activation of production capacities and projects and to raise the efficiency of capital investments. The collective has indeed seen the principles of this document as reliable guidelines of the work to be done in the republic toward complete satisfaction of rural demands for construction services.

Our principal task is to deliver new construction projects ready for operation "to the last detail" in precise accordance with the allowed construction time.

That indeed is our practice in building houses for rural housing cooperatives. The association has also assumed the obligations of the client, in particular the management of housing construction. It aids kolkhozes and sovkhoses, which have also become our shareholders, to organize cooperatives, it submits dwelling designs for selection, it organizes preparation of technical documentation, and by order of the cooperatives it does the engineering supervision of construction and finances it.

Not everything in this procedure has been worked out as it should have been. But the initial experience in construction "to the last detail" is now in, and there is a realistic possibility of disseminating it as widely as possible. The prerequisites have already been achieved. The average capacity of interkolkhoz contractors [MSO] in the republic exceeds 7 million rubles in terms of the annual volume of construction and installation work, and the largest of them do 11-16 million rubles worth of construction and installation work in a year. Most of the MSO's are operating under the new system of planning and economic incentives, their output-capital ratio is not bad, and they have normal profitability. The association is also ready in terms of the size and qualifications of its staff to assume those functions which are now performed by kolkhozes and sovkhoses. These are substantial obligations: the technical specifications for project planning must be obtained, as must the permit for use of energy resources, and construction organizations must also be given the principal reference points on the site for the buildings and structures to be built, the quality of construction must be monitored, they must participate in filling out documents to cover skrytyy work, manufacturing equipment has to be ordered and turned over to the contractors, and so on and so forth.

Performance of all these functions requires specialized knowledge and quite a bit of experience which agricultural specialists may not have. And indeed why should this burden be put on the farms, when they have subscribed their shares to create an entire system capable of coping with all these tasks?!

Of course, if the construction project is to be delivered "complete to the last detail," it is not enough to assign to contractors obligations which are new to them, they must also be given certain additional rights. The first one which is indispensable to transition to the principle of construction "complete to the last detail" is the straightforward accuracy and stability of capital construction plans on kolkhozes and sovkhoses and also of plans for activation of facilities and construction projects of contractors, and the system of continuous planning must be provided for in both cases.

The decision to establish a stable 5-year plan for capital construction (with the assignments broken down by years) beginning with the 11th Five-Year Plan was gratifying to us, and we have to say that we are prepared for that kind of work.

Back in 1977 the Estonian SSR Ministry of Agriculture, jointly with Estkolkhozstroy, made the transition to 3-year continuous planning of capital construction by projects, including the plan for their activation. Our 3-year plan is a working document. At present it is not approved by anyone. But it guides the ministry, the association, and MSO's in their everyday work, and that yields an important constructive result.

After all, when we know in 1979, say, the projects to be activated and the makeup of construction work in 1981, we can prepare ourselves better for production of the necessary fabrications and components, we can build up the

necessary production gear in good time, we can train workers in those specialties which will be needed in greater numbers because of changes in the makeup of construction work. More than that. Our project planning institute now has a project-by-project plan for project planning and surveying. This means a considerable improvement in delivery of project plans and estimates to MSO's. Before introduction of 3-year planning only 62 percent of all the association's projects received project plans and estimates by 1 September, the figure was only 28 percent for projects being carried over to the next year. In 1979 plans and estimates had been furnished for 76 percent of the projects by 1 September 1978, and the figure was 54 percent for projects being carried over to 1980. At the present time the delivery of project plans and estimates is continuing to improve, though we are aware that a great deal still remains to be done. Even now, after all, the entire technical documentation for the coming year should be delivered not by 1 September, but by 1 July of the year preceding the planning year. We are convinced that we will accomplish this.

The second condition necessary to transition to construction complete "to the last detail," is improvement of the practice of material and technical supply. In future the 5-year capital construction plan should be completely balanced against the available materials, manufacturing equipment and power plant equipment. This is a very important task. Its performance also requires radical improvement of the entire performance of the supply system. At present physical resources are allocated through two channels: one portion is delivered to contractors by supply organizations, while the other is delivered to clients, i.e., to kolkhozes and sovkhozes, which must in turn deliver them to the contractors. The needs of interkolkhoz organizations with respect to the first portion are not being met very satisfactorily. On paper, to be sure, nearly everything seems to be in order. You will be doing work worth so-and-so many millions of rubles, they tell us. For every million they assume so much and so much cement, metal, radiators, roofing and other materials. We multiply these figures, and you have what you need, what more could you ask for! But there is something in this that planning and supply agencies do not see or pretend not to see: the so-called "standard amounts per million" used in allocating materials are hopelessly outdated. The resulting gap between the actual needs and those which are planned is enormous. Here are the 1978 figures: our association was allocated 84 percent of the steel it needed, 92 percent of the cement, 73 percent of the glazed tile, 56 percent of the vitreous floor tile, 37 percent of thicker window glass, between 26 and 32 percent of the paints, and only 60-70 percent of the cast-iron pipe. At present a large portion of the strength and energy of the technical personnel of MSO's goes to the search for additional resources and substitutes and to changing designs. In our view there is only one way of doing away with these oversights: construction projects should be supplied materials precisely in accordance with project plans and cost estimates.

But after all a considerable portion of resources are now allocated to contractors through clients. In the system of construction finished "to the

last detail" this is another burden that should be taken off the farms. Moreover, this is the kind of fear that arises: at present if the farms are unable to obtain something, they agree to a substitute or even accept the project without some processing unit or assembly, but as soon as the delivery of these assemblies becomes the contractor's obligation, the kolkhozes and sovkhoses will really begin to demand that the contractor complete the project as designed. And they will be right! This means that we must guarantee full coverage of the equipment and materials needed for projects being built "to the last detail." It seems to us that the responsibility for aggregate supply should be placed on supply agencies by law. Moreover, it would be fair to make it a practice of awarding economic incentives to supply agencies for punctual and complete supply of materials and equipment to construction projects. The portion of the bonus envisaged for activation of projects on schedule or ahead of schedule should be set aside for that purpose.

The third condition of the transition to construction complete "to the last detail" is establishing order in the services responsible for unpacking, inspecting, setting up before installation, and control assembly, testing and adjustment of manufacturing equipment as well as the delivery of nonstandard equipment.

It might be objected to what I have said that some of these procedures are not covered by law. It is said that they ought not to be, since equipment is supposedly of high quality and complete when delivered. Yes, that is the way it should be. But you cannot escape reality. At present kolkhozes and sovkhoses spend a great deal of time and energy readying the assemblies, processing units and components which arrive. Insofar as these costs exceed the cost estimate, the farms which are the clients pay the difference from their principal activity. If in future the farms are to pay for the project finished "to the last detail" in accordance with the cost estimate, the contractor will have the problem: from what source is this work to be paid from? Who will do it?

Our opinion is that the duties of readying manufacturing equipment and deliveries of nonstandard equipment could be made the responsibility of the State Committee for Supply of Production Equipment for Agriculture; a firm procedure would be established whereby the client farms finance this work in excess of the estimated cost, and in the justified cases they would be entitled to adequate reimbursement of costs by supplier plants.

We are convinced that as the projected steps are taken to improve the economic system, there will also be solutions to these and other problems whose solution is indispensable for delivery of projects finished "to the last detail" to become the rule at every rural construction site.

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CSO: 1821



## CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

### OFF-SITE RURAL HOUSING CONSTRUCTION EMPHASIZED

Moscow SEL'SKAYA ZHIZN' in Russian 24 Nov 79 p 1

[Editorial: "More New Tenants"]

[Text] Zinaida and Mikhail Nikiforov, young workers of the sovkhos Krasnyy Frontovik in Pskovskaya Oblast, received a generous wedding gift: they were presented the keys of a two-room apartment in a new street of the sovkhos settlement. Even here, on the transformed land of the Russian Nonchernozem Zone, and in thousands of other villages, one of the principles of the decision of the July (1978) Plenum of the CPSU Central Committee is being implemented: the need for greater attention of party, Soviet and trade union organizations and economic entities to the business of reorganizing rural areas and improving the housing and the cultural and consumer services of rural workers.

Providing well-equipped housing to the rural population has become one of the important elements of the party's present farm policy. Over the last 13 years more housing has been built in rural localities than the housing stock which all the country's cities had before the war, in 1940. Current plans call for addition of nearly 12 million square meters of housing for sovkhoses and kolkhoses alone. Quite a bit of housing will go to other agricultural enterprises, and it will be built by private contractors. The solidity and permanence of new structures have increased incomparably, along with the provision made for utilities. There is steady improvement in the project planning of housing construction; more and more it is being based on a system of progressive standards. The principal guideline here is that as a rule families are furnished well-equipped detached dwellings with garden plots and outbuildings for livestock, poultry and their own vehicles.

New opportunities for fuller satisfaction of the needs of the rural population for well-equipped dwellings is being opened up by the decree of the CPSU Central Committee and USSR Council of Ministers entitled "On Further Development of Off-Site Production of Wood Panel Houses and Sets of Wooden Components for Houses Built From Local Materials for Rural Housing Construction." Plans for the next few years call for new construction or expansion of 78 housing construction and woodworking enterprises, 23 machinebuilding

and metal manufacturing plants and 31 enterprises in the building materials industry. The purpose is to build a solid foundation for off-site production of dwellings for rural locations that will meet both present and future requirements. In addition to housing construction combines themselves, plants will be built to produce stock sanitary engineering pipe, materials and other articles necessary to manufacturing and outfitting the dwellings. Under contracts with the clients they are delivered along with the components for farm construction projects. The relevant production plants are being built on a new technical base in the timber and woodworking industry, the building materials industry, the chemical industry, the petroleum refining industry and the petrochemical industry. The largest construction ministries and the greatest efforts of machinebuilders, metallurgists and workers in a number of other departments are being enlisted to build a practically new sector of the economy--off-site rural housing construction.

Kolkhoz members and sovkhos workers and all rural workers welcomed the decree with a feeling of deep gratitude to the party and government for the new concern it has shown for improvement of rural living conditions. They are convinced that everyone responsible for implementing the decree will do everything possible so that the sector comes into being precisely on schedule. Moreover, they know in rural areas that a number of enterprises for production of up-to-date wooden-panel houses are already in operation. They have been built, for example, by interkolkhoz construction organizations in Penzenskaya Oblast, Lithuanian and Latvia. However great their difficulties may be in adjusting production and obtaining all the adequate materials and equipment, it is important to be more persistent in bringing these capacities up to rated output and to move faster with designs. Greater efforts have been undertaken in recent years by the USSR Ministry of the Timber and Woodworking Industry to produce the housing needed in rural areas. Even now its enterprises are able to speed up the manufacture of dwellings in the new series and to give fuller consideration to the demands that have arisen.

From the very first days of implementation of this very important special-purpose program, local party, Soviet and economic entities were called upon to actively supervise solution of the problems it raises. At the same time unstinting attention must be paid to other aspects of activity involved in speeding up rural housing construction. In recent years fair-sized capacities for fully prefabricated housing construction have been built in the USSR Ministry of Rural Construction and interkolkhoz construction associations. But they are not all being satisfactorily utilized, especially in Bryanskaya and Orlovskaya oblasts, Krasnoyarskiy Kray, and a number of other regions of the country. Effective measures need to be adopted to overcome the lag of housing construction on the farms of Kaluzhskaya, Voronezhskaya and Chitinskaya oblasts and a number of rayons in the Ukraine and Kirgiziya.

Activity related to private and cooperative construction partially financed by rural inhabitants needs to be invigorated. The agricultural production administration of Yaroslavskaya Oblast Ispolkom took the proper steps after

it was criticized: it was proposed that explanatory work be done in all kolkhozes and sovkhoses in order to discover families willing to build their own houses on preferential terms. The same procedure should be followed in other regions of the country as well. The problem of punctual information to the public about housing designs which have been prepared for rural areas remains unsolved. In a number of places housing continues to be accepted in an unfinished state. In the settlement Kochetov in Chuguyevskiy Rayon of Khar'kovskaya Oblast, for example, personnel of Sel'khoztekhnika have moved into a 15-unit apartment house. "The design," N. M. Durasov writes, "called for basement rooms and outbuildings. None of that was done. Even in the apartments themselves everything had to be redone--whitewashing and painting...." The joy of new tenants cannot be allowed to be darkened because of people who do careless work and those who let them get away with it!

The correct approach to rural construction, one that takes into account the peculiarities of the life and interests of the rural population, along with a resolute attitude of greater exactingness toward all those involved in carrying out the projected steps to speed up housing construction, will be an important step toward gradually overcoming differences in cultural and consumer services between the city and rural areas.

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## CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

### PROBLEMS IN AGRICULTURAL CONSTRUCTION OUTLINED

Moscow STROITEL'NAYA GAZETA in Russian 30 Sep 79 p 2

[Article by D. Kondrashov, secretary of the Tul'skaya Oblast Party Committee: "The Systems Approach Is Needed"]

[Text] The article by S. Dement'yev, deputy chairman of RSFSR Gosstroy, entitled "The Client Is Holding Things Up," which was published in STROITEL'NAYA GAZETA, No 65, 1979, thoroughly exposes the state of affairs with adoption of "Orel continuity" at construction projects of the Nonchernozem Zone.

In the 10th Five-Year Plan 1.33 billion rubles of capital investments, or 1.8-fold more than was invested in the years of the Ninth Five-Year Plan, have been appropriated for development of agriculture in Tul'skaya Oblast. The oblast party organization is directing the efforts of local party and Soviet agencies and all participants in agricultural production toward sensible use of these tremendous funds and toward comprehensive transformation of the appearance of rural areas.

We are well aware that given the considerable shortage of manpower resources in the oblast successful performance of these tasks depends largely on improved organization of the construction process in rural areas and above all on adoption of "Orel continuity" from the design stage to actual construction.

In Tul'skaya Oblast preparation for adoption of continuous planning and flow-line construction began in 1977. A coordinating center was set up in association with the oblast ispolkom and has been doing its work, in the oblast agricultural production administration there is a work group, and in the oblast's organizations doing contract work--Glavpriokskstroy and the oblast kolkhoz construction associations--there are operations control centers. The oblast ispolkom has approved "Measures To Prepare and Adopt the System of Long-Range Flow-Line Construction (SIDPS) in 1978 on the Basis of Comprehensive Continuous Planning" and "Recommendations Concerning the Organizational Structure and Procedure for the Functioning of the Coordinating Center."

Two general project planning institutes have been designated: Tulagiprosel'khozstroy and Tulakolkhozstroyproyekt of the oblast kolkhoz construction association. Specialists of the design and production planning institute of the USSR Ministry of Industrial Construction have been enlisted to compile a binding schedule for flow-line construction. The functions of the single client have been turned over to the capital construction administration for kolkhoz construction on 206 farms, to a unified construction directorate on 116 sovkhoses, and to directorates for construction of complexes and other projects within the associations Yasnaya Polyana and Privol'ye.

Binding schedules for construction of residential and cultural and consumer service facilities on the oblast's sovkhoses were compiled in 1978 and 1979. Under these documents construction and installation work is to be done on 607 projects to be completed and to be carried over.

Some results have been achieved. Experience has been gained in building large highly mechanized complexes for milk production (with a unit capacity of 800-1,200 head) and for raising and fattening cattle, sheep and poultry. Last year the flow-line method of construction was extended over rural housing projects representing 88,000 square meters of effective floor space (the construction time of rural housing was 1 month less than in 1977), 5 children's preschool institutions, and 3 regular schools and other facilities providing social, cultural and consumer services. Work has been done to provide conveniences and build rural roads in the amount of 11.3 million rubles.

The share of large-panel housing construction is growing every year in rural areas. Once the rural housing construction combines are put into operation in the cities of Suvorov and Shchekino and the large-panel housing construction plant undergoes reconstruction in Novomoskovsk, the total capacity for panel housing construction in the oblast will reach 400,000 square meters in 1982 and 1983. Measures toward comprehensive development of settlements are being carried out to improve the living conditions of rural workers. The oblast party committee has created a council for guidance and supervision over construction of nonproduction facilities with the secretary of the party obkom serving as chairman. A council has examined measures related to comprehensive project planning and construction in the 1980-1985 period of 70 rural settlements for the personnel of 149 farms: 85 sovkhoses and 64 kolkhoses.

Experimental development of the central homestead of the Kolkhoz-Plant imeni Lenin in Novomoskovskiy Rayon in accordance with improved project plans will make it possible to diversify and upgrade construction of rural settlements in the oblast. Dissemination of this experience will create the most favorable conditions for adoption of "Orel continuity" in rural areas.

At the same time there are a number of reasons for failures in fully adopting this method in agricultural construction so far. The 2-year plans and construction flows which have been drafted in rural areas are not uncommonly



amended while the work is going on. Oblast and rayon agricultural production administrations lack competent specialists capable of compiling sound multiannual plans and of making competent expert evaluations of project plans and cost estimates.

The directorates which have been set up are not altogether solving the problems facing rural construction. The trouble is that the directorates have not been granted the authority to coordinate the actions of all the services of the clients. That is why the shaping of the plan goes slowly in the oblast as a whole.

Fulfillment of rural construction plans is made more difficult because there is no catalog of current designs of dwellings and buildings for cultural and consumer service facilities in the Nonchernozem Zone, nor a unified classification of technologies and production of equipment related to fodder production and removal and cleaning of agricultural waste.

The structure of the client's service needs to be improved and standards should be devised for the size of the staff handling capital construction at the oblast and rayon level. It is obvious that capital investments to build depots for aggregate supply of rural construction sites should be specifically designated for that purpose. The project planning institutes Tulagiprosel'khozstroy and Tulakolkhozstroyproyekt need qualified personnel and housing construction funds to purchase office machines and vehicles.

In our opinion, if these problems were solved by the appropriate ministries and departments, above all the RSFSR Ministry of Agriculture, it would be easier for the oblast party organization to perform the tasks defined in the decree of the CPSU Central Committee and USSR Council of Ministers concerning the Nonchernozem Zone.

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## CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

### DECREE ON OFF-SITE RURAL WOOD HOUSE CONSTRUCTION

Moscow STROITEL'NAYA GAZETA in Russian 18 Nov 79 p 3

[Outline of decree adopted by the CPSU Central Committee and USSR Council of Ministers: "Activities of the CPSU Central Committee and USSR Council of Ministers"]

[Text] The CPSU Central Committee and USSR Council of Ministers have adopted a decree entitled "On Further Development of Off-Site Production of Wood Panel Houses and Sets of Wood Components for Houses Constructed of Local Materials for Rural Housing Construction."

The decree notes that in recent years a number of steps have been taken in the country to promote the further development of agricultural production and the public services and social amenities of rural settlements. But the existing construction capability is not keeping up the necessary pace in construction of dwellings and cultural and consumer service facilities in rural localities, nor is it meeting the rural population's need for well-equipped houses.

It is recognized that one of the most important directions for improving the organization of housing construction in rural areas is to develop off-site production of wood panel houses and also to increase substantially the output of sets of wood components for dwellings whose walls are constructed from local materials.

In the interest of developing off-site production of dwellings for rural localities the CPSU Central Committee and USSR Council of Ministers have made it the duty of the central committees of the communist parties of the union republics, kray and oblast party committees, councils of ministers of union republics, USSR ministries and departments, and local Soviets of People's Deputies to give priority to full-fledged development of the production capability of industrialized housing construction in rural localities by building new enterprises and expanding existing ones for the production of up-to-date wood panel houses and also sets of components for dwellings whose walls are constructed from local building materials.

The USSR Ministry of the Timber and Woodworking Industry, a number of other USSR ministries and departments, and councils of ministers of union republics have been assigned the task of seeing that enterprises of the industry and within interkolkhoz construction organizations achieve a production of wood dwellings manufactured off site to 7.1 million square meters of total floor space per year by 1985 and 11 million square meters by 1990 and also to bring the production of sets of wood components for dwellings whose walls are constructed from local materials up to 8.5 and 12.2 million square meters of total floor space per year by those respective years. During that period plans call for building and expanding 78 housing construction and woodworking enterprises, 23 machinebuilding and metal manufacturing plants and 31 enterprises of the building materials industry. Housing construction combines are to be located so as to bring them as close as possible to raw materials and the areas where housing is to be built.

The USSR Ministry of the Timber and Woodworking Industry, the USSR Ministry of Internal Affairs, the USSR Ministry of Industrial Construction, the USSR Ministry of Rural Construction, the USSR Ministry of Construction, the USSR Ministry of Construction of Heavy Industry Enterprises, the USSR Ministry of Transport Construction and Ministry of Power and Electrification, the RSFSR Council of Ministers and Ukrainian SSR Council of Ministers have been ordered to make provision for new construction and expansion in the 1980-1989 period of housing construction and woodworking enterprises plants for production of sanitary engineering pipe stock, nonstandard manufacturing equipment and spare parts for it.

The State Committee for Public Works Construction and Architecture of USSR Gosstroy has been given the responsibility of conducting a uniform technical policy in the design and erection of factory-made wood houses, the organization of research and development projects in this field, and enforcement of construction standards and codes.

The USSR Ministry of the Timber and Woodworking Industry is ordered to conduct a uniform technical policy in the field of wood house manufacture, to introduce progressive manufacturing methods, to develop specifications for manufacturing equipment, fabrication materials, finishing materials, and components, to design house manufacturing enterprises, to conduct scientific research into the technology of wood house manufacturing and to create effective materials derived from wood, and to develop methods of transporting fabrications to construction sites.

The decree calls for construction of single-story and two-story houses so as to take into account natural and climatic conditions, complete with wiring and plumbing and a choice of heating systems for different fuels. Under contract with clients dwellings would be delivered along with kits for farm buildings.

At enterprises of the USSR Ministry of Construction Materials Industry and also a number of other ministries there are plans to build new and expand

existing capacities for production of building materials. Provision has been made for construction of plants that manufacture rock wool products, gypsum-fiber and cement-shaving board, and asbestos-cement and gypsum-paper-board sheets.

The Ministry of Machine Tool and Tool Building Industry has been given responsibility for developing, putting into production and manufacturing flow, automatic and semiautomatic lines and highly productive sets of equipment for the production of wood panel dwellings, parquet floors, millwork and other wood products, as well as the functions of general supplier of these production lines and equipment. To develop the machinebuilding capability a number of enterprises for the production of woodworking equipment are to be expanded in the 1980-1984 period.

The Ministry of Construction, Road and Municipal Machinebuilding and Ministry of Chemical and Petroleum Machinebuilding, in cooperative arrangements with other ministries, have been given assignments for developing and manufacturing a variety of manufacturing equipment for the production of materials and products indispensable to the production and outfitting of factory-made dwellings. There are specific plans to organize the output of production lines for cement-shaving board, gypsum-paperboard sheets and Arbolite panels, glass bundles (steklopakety), lines for coloring asbestos-cement sheet, and equipment for manufacturing rubber and plastic components.

The USSR Ministry of Chemical Industry and the USSR Ministry of Petroleum Refining and Petrochemical Industry are recommended to take steps toward a considerable increase in the production of products of the chemical industry for housing construction--foamed plastics, caulking and sealing materials, polyethylene film, resins, paints and other materials.

The USSR Ministry of Aircraft Industry, the USSR Ministry of Installation and Special Construction Work, the USSR Ministry of Ferrous Metallurgy, the USSR Ministry of Gas Industry, the Lithuanian SSR Council of Ministers and Latvian SSR Council of Ministers, in the interest of fitting out factory-made wood houses, have been given assignments for delivery of heating units, plumbing equipment, valves, aluminum products, steel strip and electrical supplies to housing construction enterprises.

In the interest of expanding the training of qualified workers for the wood housing construction industry, the target has been set of building eight vocational and technical schools in the 1981-1983 period.

Performance of work to build panel houses and houses constructed with walls made from local materials in rural localities has been made the responsibility of the organizations of the USSR Ministry of Rural Construction and interkolkhoz construction organizations, and in regions where these organizations do not exist, the responsibility has been placed on construction and installation contractors of other construction ministries.

Councils of ministers of union and autonomous republics and ispolkoms of kray and oblast Soviets of People's Deputies have been issued a recommendation that they see to the punctual preparation of plans for layout and general development of rural settlements with a view to extensive use of wood-panel dwellings and dwellings made with sets of wood and other components combined with walls made of local materials in the development of these settlements.

Councils of ministers of union republics, Tsentrosoyuz and the USSR Ministry of Trade have been ordered to take steps to develop the trade in factory-made wood houses and sets of wood and other components for dwellings constructed from local materials. USSR Gosplan and USSR Gossnab are ordered to make provision in the preparation of drafts of annual plans for an increase in market stocks in accordance with the orders of the USSR Ministry of Trade and Tsentrosoyuz for the purpose of off-site manufacture of wood houses and sets of wood components for houses with walls of local materials, and also for plumbing, heating and electrical equipment, slate, glass, cement and other building materials and products.

The CPSU Central Committee and USSR Council of Ministers has expressed confidence that the central committees of the communist parties of the union republics, kray and oblast party committees, councils of ministers of union and autonomous republics, ispolkoms of kray and oblast Soviets of People's Deputies, and the work force of agriculture, industry and construction will take all necessary steps to perform the exceedingly important task of reorganizing rural settlements.

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## CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

### INTERVIEW WITH RSFSR RURAL CONSTRUCTION MINISTER

Moscow STROITEL'NAYA GAZETA in Russian 28 Nov 79 p 3

[Interview with N. Mal'tsev, RSFSR minister of rural construction, by staff correspondent I. Svirin: "Plant--Transportation--Project"]

[Text] The role of rural construction combines and current problems in their further development have been the subject of a campaign conducted by STROITEL'NAYA GAZETA under the heading "Rural Construction Combines: Development Strategies." It has culminated in a conference-seminar held in the city of Kalinin. The RSFSR Ministry of Rural Construction has jurisdiction over the largest number of present SSK's [rural construction combine]--22. Our correspondent, I. Svirin, called upon N. Mal'tsev, RSFSR rural construction minister, to tell about those organizational and technical steps which the ministry intends to take in the interest of further improvement and development of SSK's.

Question: Nikolay Semenovich, we would like to begin our interview with an evaluation of the conference-seminar in Kalinin.

Answer: This conference was the first we know of to assemble such a representative council concerning the problems of a very effective new form for organizing rural construction. And we must say that the people in the industry have shown great interest in it. This is understandable. After all, the practical experience already gained shows that the organization of SSK's is an appropriate answer to the problems of industrialization--to transforming rural construction sites into sites where buildings are assembled from factory-made highly prefabricated components. This is also enhancing the prestige of the rural builder's profession as he masters up-to-date techniques. And finally, there is the possibility of delivering a project "finished to the last detail."

The conference was also worthwhile because the ministry prepared good displays of equipment, fabrications used in industrialized building, and model

rural homestead dwellings which are original in their architecture and which have good layout and construction features, while the people in Kalinin familiarized the guests with the organization of production and construction at their own SSK.

Question: Of course, the effectiveness of the conference is directly dependent on how the proposals and remarks expressed there are carried out. What is the ministry undertaking in this regard?

Answer: That is so. But do not forget that we have been involved in organizing SSK's for several years. We have followed carefully the campaign entitled "The SSK: Development Strategies," which has been conducted by STROITEI' YA GAZETA. There has also been a discussion in the literature from the standpoint of practitioners. So we came to the conference after analyzing everything that has been gained in the process of operating the SSK's. But actual practice, as we know, knows no prejudices and spares no one.

Question: Nikolay Semenovich, forgive me for saying so, but at present the work is going badly....

Answer: Agreed. The principal shortcoming is that the organizational structure of rural construction combines has not been brought into full conformity with the "Temporary Guidelines on Organization and Activity of SSK's" nor with the principles of our own order which we issued jointly with RSFSR Gosstroy. A considerable number of rural construction administrations and trusts have not transferred to the operational jurisdiction of SSK's their motorized construction krays, organizations for the performance of special construction work, and mechanization sections. That is, the "plant--transportation--construction project" conveyor has not been altogether linked up to form a single chain. And what is the result? We quickly set up the "little boxes" of buildings, but when we begin to equip and finish them, it goes slowly. As we see, the principal task for which the SSK was created is not being performed; they are not always delivering finished projects to the plant by any means.

Moreover, the capabilities of the combines are not being fully utilized.

Question: And even main administrations are not furnishing the SSK's all the cement, metal and millwork they require. Production is held back....

Answer: Well, production is not being held up. Though we cannot deny cases of interruptions and incompleteness of deliveries. This is very costly to the collectives of the SSK's: the pace of operation of plants and builders is disrupted, and probably deadlines will not be met for putting the projects into service.

Question: What steps is the ministry taking to link up the entire "plant--transportation--construction site" chain and to support the work of the SSK,

as it is now customarily termed, to deliver products "finished to the last detail"?

Answer: An order has been prepared in which extensive measures are outlined. I will discuss the principal ones which bring us closer to a solution to the problem. Beginning in January 1980 the SSK's become responsible for performance of all the construction and installation work, including finishing, required for the above-ground portion of buildings. By the end of this year we will set up and place under jurisdiction of SSK's and DSK's [housing construction combine] motorized construction crews, sections for specialized construction work and mechanization, and we will staff and equip them. Our ultimate task is to bring the combines up to their rated capacity and to see that they fulfill their assignments for their volume of work and activation of finished projects. Beginning in January of the coming year all the combines will begin to operate in accordance with this structural scheme.

Those combines which themselves use at least 90 percent of their own fabrications and products we will put on a unified construction balance sheet. In the coming year all installation, general construction, transport and excavation crews of SSK's we will put on a subcontracting basis, and we will develop competition among them.

So that there are no disruptions in the operation of SSK's we intend to organize the supply of materials and equipment on the basis of the physical volume of operations called for in the approved program. These resources will be specifically allocated to the SSK's.

Question: How are relations with the client taking shape, and what shape should they take?

Answer: The principal problem is to organize straightforward planning of the load on the SSK. In this area a great deal depends, of course, on the client. It is very important to adopt the Orel experience with "continuity." Jointly with RSFSR Gosstroy and the republic agriculture ministry we have begun an experiment in 2-year planning of rural construction in a number of oblasts. But we have not yet been able to achieve much in this important area. The reason is that the client has not been able to fully carry out those steps which he has planned. Even good 2-year plans for organization of construction are frequently not fulfilled. Now if the client does not remove obstacles to "continuity," then a repetition of the situation that has come about will make it still more difficult to solve the problem: the volume of construction is growing larger every year.

Question: Nikolay Semenovich, thank you for the interview. Let me take this opportunity to congratulate you cordially on your 60th birthday and your high government award and wish you good health and creative achievements.

Answer: Thank you very much!

## CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

### STANDARD NET OUTPUT INDICATOR IN BUILDING MATERIALS INDUSTRY

Moscow STROITEL'NAYA GAZETA in Russian 28 Sep 79 p 2

[Article by I. Osipov, Acting Chief of Glavmospromstroymaterialy, and V. Kovalenko, Deputy Director of the Design and Technology Office, Mosorgstroymaterialy: "Contrary to the Magic of Gross Output"]

[Text] Everybody involved with matters of planning and economic incentive knows that this system, which is based on gross indices, has come into a sharp conflict with the party's elaborated policy of increasing efficiency of production and is not linked with the end results of economic activity. This has predetermined the search for new indices which would not submit to the magic of "gross" and would not operate contrary to the economic interests of the state.

The result of this search is the "standard or normative net output" (NChP) indicator, which was adopted three and a half years ago in the practical operations of enterprises of Glavmospromstroymaterialy. Twenty-four pre-cast reinforced concrete plants began utilizing it experimentally in January 1976. Two years later it was employed for planning and performance evaluation of all 77 associations and enterprises of five branches of the main administration, representing a total work force of 70,000.

Our experiment, alongside experiments at the Ministry of Heavy and Transport Machine Building, Ministry of Power Machine Building and other agencies, helped not only find but also elaborate many elements of planning on the NChP indicator and became a foundation, as it were, in determining ways to improve the economic mechanism, which subsequently were formally stated in the CPSU Central Committee and USSR Council of Ministers Decree entitled "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality."

Three and a half years is a sufficient amount of time in order comprehensively to evaluate the new indicator, to perform the requisite analysis of this indicator, and to draw conclusions. Just was is this indicator?

The NChP is a newly created value, which includes wages of industrial production personnel, contributions to social insurance, and profit. Net output is determined on the basis of standard amounts which comprise a portion of the wholesale price, obtained by subtracting from it material outlays figured in plan-specified production cost. Put in simpler terms, one can state that this is an indicator which enables one to effect enterprise planning and incentive on the basis of enterprise labor outlays, without utilizing the cost of purchased materials in evaluating enterprise performance.

The shift to planning and evaluating the performance of plants in the new manner was implemented in four stages. First we established a system of stable net output standards, then prepared annual and five-year NChP plan targets for production volume and labor productivity, introduced the requisite changes into the wage bonus systems, reorganized accounting and record keeping and, finally, adopted the new indicator in practical shop planning and performance evaluation.

Naturally reorientation of work forces to utilization of this indicator is no simple matter; there are many difficulties involved.

The first stage was the most laborious, that is, the stage of elaboration of standard amounts. It comprised approximately 70% of all labor outlays on adoption of the new indicator.

How do we employ the normative net output indicator in our work?

It forms the basis of annual and five-year production plans. Its growth rate also determines the size of economic incentive funds. It has also been introduced as the principal indicator in wage bonus provisions for engineer-technician personnel and white-collar workers.

This is not only a fair but also an economically substantiated indicator, adequate to generation of national income in the nation's economy. But its main virtue lies in the fact that it exerts direct influence on growth in production efficiency and improvement in product quality.

Take the precast reinforced concrete enterprises, which have been operating with the new indicator longer than other branches, and consequently the results of its employment have been tested by time to a greater measure. In 3 years labor productivity in this subbranch has increased by 11.9%, with a plan-targeted 10.9%. The result is the labor of 1,800 workers saved. The rate of putting new product items into production has doubled. In the past we would add as many as 350 new product items each year, while now the figure has climbed to 700, and as a rule these are items with less materials requirements (incidentally, organization of production of a broad variety of product items of a uniform catalogue, and more than 2,500 item designations for the 1980 Olympics was resolved only thanks to the new indicator. The end result in construction was achieved with less material outlays). The materials requirements of precast reinforced concrete were reduced by approximately 2% during this time, that is, savings



of 64,000 tons of cement were achieved, plus 9,000 tons of metal, more than 12,000 tons of standard fuel, approximately 16 million kilowatt hours of electricity, etc.

Fulfillment of product list plan targets improved appreciably because enterprises stopped dividing products into profitable and unprofitable, and the time required to supply all components of fully prefabricated buildings was reduced by 10-15%. Product quality also improved.

An analysis of enterprise operations indicates, however, that possibilities for increasing production efficiency are not yet being fully utilized. Of the three value indices contained in the present system of planning and evaluation of work force performance, two (production volume and labor productivity growth) are determined on the basis of NChP, while the third, most important one — profit — is still dependent on price level.

With the current principles of pricing, the level of prices continues to be closely linked with the materials-intensiveness of production. Therefore at the first stage of employment of normative net output we were unable fully to eliminate the influence of the factor of materials intensiveness on comprehensive evaluation of enterprise performance results. In addition, net output standard amounts were individual. This led to a situation where differing standard amounts would be set for one and the same products produced at different enterprises.

The above-mentioned CPSU Central Committee and USSR Council of Ministers Decree, in order to give associations and enterprises more incentive to achieve better utilization of productive assets and to achieve savings in raw materials, provided for determining profitability in the manufacturing branches of industry, broken down by product categories, as the ratio of product to production cost, minus the cost of utilization of raw materials, fuel, power, supplies, semifinished products and component items. It was established that when introducing new wholesale prices one should simultaneously determine the net output standard amount for a corresponding item, proceeding from above-average labor intensiveness standards.

This solution creates a uniform basis for formation of a system of economic indices, including prices. Glavmospromstroymaterialy, working in coordination with the USSR State Committee for Prices, undertook an attempt to establish prices and net output standard amounts which would meet these requirements.

The Mosorgstroymaterialy Design and Technology Office, with the participation of the Scientific Research Institute of Prices, created a method according to which wholesale prices and net output standard amounts for production of prefabricated reinforced concrete and concrete structures are elaborated on a uniform basis and consolidated in so-called experimental price lists. Price List No 06-08 for reinforced concrete products was approved by the USSR State Committee for Prices on 16 April, while Price List No 06-14-01, for concretes, mortars, concrete components and other

product items, was approved by the RSFSR State Committee for Prices on 18 April 1979. Both become effective on 1 January 1980, for a period of 2 years, for all Moscow construction industry enterprises.

In these price lists profit in prices is established in relation to total industrial production ~~personal wages~~ and depreciation additions to fixed assets. Alongside elaboration of wholesale prices, average branch net output standard amounts were determined in parallel.

The new pricing methodology strengthens enterprise economic incentive to put into production items which are less materials-intensive. The magnitude of profit in the price decreases for designs and component parts involving high consumption of raw materials and supplies; on the other hand, profit increases in product items with lower materials intensiveness. After these price lists become effective, we must perform a thorough analysis of the results of employment of new prices and net output standard amounts in order to be prepared for the forthcoming revision of wholesale prices.

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## CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

### CONSTRUCTION ORGANIZER CONFERENCE HELD

Moscow STROITEL'NAYA GAZETA in Russian 24 Oct 79 p 2

[Article by L. Komarovskiy, STROITEL'NAYA GAZETA special correspondent: "Presently Only One Standard: Comments On All-Union Conference of Construction Organizers and Process Engineers"]

[Text] Twenty centuries have passed since Ancient Roman architect and scholar Marcus Vitruvius Pollion defined the triune root problem of construction: utility, strength, beauty. But today this is not enough. Today we know very well that in addition to all else, it is necessary to build fast, on a large scale, and economically, or in other words efficiently.

This task is particularly complex because, as stated in a report at the all-union conference entitled "Principal Directions of Technical Advance in Organization and Technology of Construction Production," a conference organized by the board of the Scientific and Technical Society of the Construction Industry, USSR Gosstroy, the USSR Ministry of Construction of Heavy Industry Enterprises, and the Belgorodskaya Oblast CPSU Committee, by I. A. Ganichev, deputy chairman of USSR Gosstroy, production facilities representing an estimated cost of approximately 500 billion rubles are presently under construction. At the same time we are building approximately 350,000 facilities of production designation with an annual volume of construction and erection work of approximately 37 billion rubles.

As we can see, the gap between the first and second numbers is large, and it is not decreasing with time, although many correct and needed documents have been adopted to prevent scattering of capital spending. The result of this situation is that today, with a more than "sparing" standard -- 65% -- uncompleted construction comprises 85%. The duration of construction of many enterprises substantially exceeds standard timetables. The situation as regards providing construction projects with resources and supplies has also become sharply aggravated in recent years. There is a shortage of manpower on the overwhelming majority of construction jobs. And this is not surprising: even considering that more than 11 million persons are employed in our branch, the scattering of manpower is such that the average number of persons working per construction job is 13.

This is certainly a difficult situation. And there is only one solution -- earliest possible implementation of the CPSU Central Committee and USSR Council of Ministers Decree entitled "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Improving Production Efficiency and Work Quality."

The effectiveness of any decision depends on the concrete executing personnel. We all know that a plan should include only those construction projects for which design-estimate documentation and working drawings for a year's work are available by 1 September. And yet it is universal practice that general contractor organizations begin construction on projects which are not fully supplied with documentation. The decree on improving the economic mechanism specifies shifting the documentation submission deadline back two months -- to 1 July. This practice will be adopted in 1981. But will it be effective? I. A. Ganichev appealed to the conferees to abandon the practice of mutual bureaucratic rule and strictly to observe plan and contract discipline -- only in this manner is it possible to extract maximum benefit from a most important document adopted by the party and government.

One substantial problem is the disordered character of construction management in the various regions of this country. This matter was discussed by I. A. Bystrov, chief of the organization and technology of construction division of USSR Gosstroy, and V. V. Shakhparonov, deputy director of the TsNIIOMTP [Central Scientific Research Institute of Experimental Design for Organizing, Mechanizing and Rendering Technical Assistance to Construction]. The figures cited by them enable us to analyze the reason for slow growth of, and in a number of cases decrease in labor productivity at construction sites. For example, the territorial main administrations of the USSR Ministry of Construction of Heavy Industry Enterprises, the USSR Ministry of Industrial Construction, and USSR Ministry of Construction perform on the average not more than 30% of construction and erection volume in the areas where they are operating. An additional approximately 30-40% of construction volume is performed by the remaining construction ministries. And approximately one third of construction volume is performed by organizations subordinate to industrial, agricultural, transport and other ministries, agencies, and Soviets. Each of the numerous small construction organizations operating in the same territory but subordinate to various ministries and agencies establishes its own production base, thus increasing requirements in additional capital spending and worsening effectiveness of utilization of fixed productive assets and labor resources.

Practical experience of construction in Tyumenskaya Oblast convinces us that this is so. A great many organizations involved in the development of Western Siberia handle their own construction needs. The most diversified agencies, even agencies which are far from construction, such as trade, maintain their own small and poor-capability construction administrations, sections, etc. It is impossible to establish a powerful construction base with such a scattering of manpower and assets. Naturally the number of persons employed in little-productive labor on auxiliary jobs is also increasing. Only 71% of the workers in our branch are engaged in construction and erection jobs, while the remainder are working at auxiliary

operations and enterprises. And this is more than 2 million persons!

Today, even taking into consideration the acute need for such material as steel, the construction sector is proceeding along a different path: it is taking into consideration not only the factor of obtaining production as rapidly as possible, but also efficiency of plant construction. Particularly interesting in this regard was a statement made by P. A. Zhurilo, chief of the Elektrometallurgstroy Combine of the USSR Ministry of Construction of Heavy Industry Enterprises. The combine is building a very large electrometallurgical enterprise near Staryy Oskol, which will produce 7 million tons of oxidized pellets, 5 million tons of metallized pellets, 3.5 million tons of steel, and 2.7 million tons of merchant shapes and sheet. According to preliminary calculations, the cost of just the first unit of OEMK is estimated at 885 million rubles, while the amount of capital spending on construction of this project each year should reach the level of the Kama Automotive Plant complex.

The combine has been under construction for slightly more than 3 years. The overwhelming majority of the invested funds have been spent on base enterprises, housing, and site preparation for this future Soviet metallurgical giant. Work on the Staryy Oskol project began with the proper sequence: roads, service lines, housing, and construction industry. Unfortunately few construction projects can make this claim.

Construction began with observance of all regulations, and we should like the construction site to be a school at which other construction people can learn, right up to the final day of construction on this combine. This is precisely the intent of the USSR Ministry of Construction of Heavy Industry Enterprises naming the combine at Staryy Oskol a demonstration-model construction project.

The workers are of the same opinion. Consolidated combined brigade leader V. Glushenko, for example, who came here from the Kama Automotive Plant, claims that engineer preparations at Staryy Oskol are much better. But there could be some improvement with supply! Do we have once again a supply shortage situation? Unfortunately the brigade leader is right. There is food for thought here both for the work organizers at the "model-experimental" project and their supervisors at the USSR Ministry of Construction of Heavy Industry Enterprises.

The conferees discussed at length and in detail problems of organization. A suggestion by G. E. Korotkovskiy, manager of Glavsreduralstroy's Orgtekhstroy Trust, unquestionably merits close attention in connection with this. Analyzing the process of engineer preparation, he reached the conclusion that one of the principal components of this process is a full and detailed list of all construction-installation and other jobs which comprise the plant erection process. But such a list is created in fact when preparing the estimate. It is not recorded, however, but remains in the mind of the estimating official. Later this work is again per-



performed by production organizers directly in the construction subdivisions. Utilizing a certain method, one can immediately furnish information to practically all subsystems of the future construction project.

On the whole the conference was very useful, and particularly because it made it possible to determine realistic ways and means to carry out the measures specified by the CPSU Central Committee and USSR Council of Ministers Decree on Improving the Economic Mechanism.

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## CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

### COORDINATED SUPPLY PLANNING URGED

Moscow STROITEL'NAYA GAZETA in Russian 2 Dec 79 p 2

[Article by Doctor of Economic Sciences Professor A. Mitrofanov, Director of the Scientific Research Institute of Construction Economics: "Continuous Action of Plans"]

[Text] Much time and effort goes into producing the end product of construction even within limits of standard figures — years of hard work are required to prepare technical documentation and carry out construction and erection work. Management activity pertaining to coordinating the efforts of the many participants in the capital investment process is more complex in construction than in any other sector. Economic management practice clearly demonstrates that stable plans alone, which were discussed in the previous commentary, are insufficient for correct and prompt resolution of the problems which arise. Also essential is continuous action of these plans.

Under conditions of erection of complex production facilities and plant complexes, and implementation of large-scale programs, which basically characterizes today's construction, securement of continuous action of plans is an essential precondition for successful operation.

As has been stated numerous times in the past, in current planning practice annual construction schedules are constantly being restructured, and frequently with substantial deviations from annual five-year plan targets. They are revised, but essentially each year itemized lists are prepared anew for carryover construction. To this we should add that at the same time one must settle anew all questions pertaining to contract, supply, and financing, that is, the construction flow is interrupted in all activity categories at the point of juncture between annual plans.

The situation is changing radically with issuance of the CPSU Central Committee and USSR Council of Ministers Decree on Improving the Economic Mechanism. The established system and procedure of elaboration of inter-coordinated long-range and current plans effectively accomplish the task of ensuring their continuous operation.

The existence of a comprehensive program of scientific and technological advance covering a period extending 20 years into the future and basic directions of this country's economic and social development covering 10 years into the future, supplemented every five years by calculations for the following five-year plan, will continuously focus construction ministries and the USSR Gosstroy system on volumes, shifts in placement and character of programs and direction of technical policy in construction in the plan-covered period. Advance preparation of control figures for the forthcoming five-year plan (one year before it begins) and a draft stable five-year plan (not later than five months prior to initiation of the five-year plan) will ensure continuous operation of five-year plans. Lists of newly-begun enterprises and structures, lists of existing facilities slated for renovation and expansion, as well as itemized lists remaining unaltered for the entire period of construction, with targets broken down by years, ratified as components of the five-year plans, become the basis of the mechanism of continuous operation for the construction people. Stability and continuity of operation of itemized lists will also be secured by their mandatory character not only for clients and contractors but also for planning, finance, banking and supply agencies as well as suppliers of equipment and structures.

Continuity of action will also affect directly and primarily current construction working schedules. Under conditions of a stable five-year plan and an annual plan drawn up in advance on the basis of the five-year plan, in combination with measures specified in the decree pertaining to ensuring continuous financing and supply, this problem can also in principle be resolved.

Continuous financing is secured by extensive opportunities to obtain bank credit for all construction project participants: clients, contractors, general suppliers of complete sets of equipment, and design organizations. A number of measures have been directed toward this in the area of supply. Changeover of construction projects, specified by the state plan, to comprehensive supply on orders submitted by construction organizations will be completed in 1981. Orders for delivery of basic process and power equipment should be drawn up for the entire period of construction, and for delivery of metal structures as a rule not less than for a period of 2 years in advance. On the whole further development and strengthening of long-term direct economic relations, universal dissemination of advanced forms of supply according to the production-process batch supply method, expansion of the practice of deliveries and installation of complete sets of equipment, means of mechanization and gear by the general supplier, and increasing financial liability of supply agencies and transport organizations will help ensure continuous and guaranteed supply.

Hard, persistent work to achieve these prerequisites is needed. We can learn much in this area from the wealth of experience of the Orel construction people as well as many construction work forces in Moscow, Leningrad, Kiev, Alma-Ata, Vil'nyus, rural construction workers in the

Southern Urals, Moldavia, and elsewhere. The main thing in this experience is a combination of a continuously operating two-year plan with organization of long-term supply flows, centralization of client functions, regulation of supply, and coordination of the work of design organizations.

We believe that the USSR Ministry of Industrial Construction has found a successful organizational-technical solution to utilization of a "two-year plan" within the framework of the five-year plan, with organization of industrial long-term (five-year) construction flows for single-type industrial installations and facilities. The system of measures specified for this aims at coordination of the work of planning agencies, equipment suppliers, design, engineering, scientific research, construction and installation organizations. The ministry has already acquired practical experience in employment of such a system for industrial continuous flow construction in the construction of petrochemical and oil refining facilities.

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## CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

### CONSTRUCTION MANAGEMENT INNOVATION DISCUSSED

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 13 Oct 79 p 2

[Article by KOMSOMOL'SKAYA PRAVDA Correspondent V. Kachurin: "Toward Innovation -- In the Old Way"]

[Text] In the 22 September issue of KOMSOMOL'SKAYA PRAVDA a report entitled "Toward Innovation -- In the Old Way...." stated that an experiment has been in progress for 6 years now on construction projects in Magadan. Initiated successfully, it has been losing steam year by year. What is hindering efforts to synthesize this interesting experiment and apply it to other construction projects it is proves worthwhile? Our correspondent decided to seek the answer at the USSR Ministry of Construction of Heavy Industry Enterprises.

"But we have already synthesized and disseminated it." V. I. Zolotarev, chief of the ministry's organization of labor and wages administration, requested that the document be brought. He was handed a thick file folder bearing the number 26. It contained a detailed scientific and technical report drawn up by staff members of the Scientific Research Institute for Organization and Management in Construction under the Moscow Construction Engineering Institute imeni V. V. Kuybyshev. It was titled "Adoption of the New Form of Linear Management."

Briefly, the innovation consists in the following. The traditional structure of construction management at the "section-brigade" level is not efficient enough. Its main problem is duplication and unclear distribution of functions between section chief, job superintendent, foreman, and brigade leader. The people at Magadan decided to simplify the management system. The brigade leader, also performing the foreman's functions, became the sole and fully-authorized person of responsibility at the construction site, while the foremen and job superintendents henceforth dealt primarily with engineering preparation for construction.

The Magadangorstroy Trust achieved savings of 1,644,000 rubles from adoption of this new innovation just in the first nine months of last year!



The people developed a greater sense of responsibility for the results of collective labor, outlays on alterations were reduced, there was less machinery and equipment idle time, organization and quality of work improved, as did morale and psychological climate in the brigade. In addition, the trust received excellent opportunities to adopt the brigade contract.

The institute recommended that construction project supervisors "adopt the low-level management system as soon as conditions are established." But unfortunately the recommendations remained on paper. Why was this? I found in the thick red file a letter from Magadan, in which the "trust work force" demanded "termination of the experiment which had been forced" upon them. Here is one of the arguments presented by the anonymous authors: "The brigade leader became financially liable and accountable, but he was given no legal rights or powers...."

It is true that the degree of his responsibility for the state of safety regulations, for example, was also not defined. Pursuant to USSR State Committee for Technical Supervision Regulations, responsibility is borne only by those engineer-technician personnel specified by the staff schedule. Since the position of brigade leader-foreman is not specified by the staff schedule, Gostekhnadzor does not recognize it.

Up to the present time nobody is really sure how the brigade leader-foreman should be paid. In the Magadansgostroy Trust he is figured in the brigade and is paid according to the work pay schedule. In the Krasnoyarskpromkhimstroy Trust and at the Glavmurmanskstroy Combine, brigade leader-foreman wages come from the management personnel fund plus a bonus for performance below specified normative time, safeguarding of structures and savings in materials. At the Vinnitsapromstroy Combine, where only engineer-technician personnel are designated brigade leader-foreman, they have a fixed salary with additions and a supplementary amount for brigade leadership. In short there is a lack of full clarity even in strict financial dealings.

Just what is the brigade leader-foreman? At enterprises of JSSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises] he is as a rule a highly-skilled worker. At USSR Minpromstroy [Ministry of Industrial Construction] he is an engineer. In the first instance specialists are concerned that the most experienced workers will be moving over to a new position from the sphere of material production. In the latter case they wonder whether an engineer, receiving a fixed salary, will have less incentive to improve the brigade's performance.

Scientists proposed: "Call the brigade leader 'brigade foreman,' as in oil and gas exploration." But then there is apprehension that there will be a sharp increase in the number of engineer-technician personnel.

Let us see what the statistics say. On construction projects of USSR Mintyazhstroy there are 19,000 brigades and 26,000 foremen, job superintendents, and section chiefs. If the brigades are consolidated, only

10,000 brigade leader-foremen will be needed. These positions can be filled with "eliminated" foremen and job superintendents. The benefit is obvious: they will take worker slots, that is, come into the sphere of material production.

In brief, the experiment is developing in two directions. And it is strange that up to the present time -- several years have passed -- there is no firm evaluation: which direction is the correct one? There is as yet no unanimity of opinion among the members of the Mintyazhstroy board. Nor has the All-Union Scientific Research and Planning Institute of Labor in Construction of USSR Gosstroy yet voiced its opinion. The Irkutsk combined division of this institute analyzed as early as 1975 the preliminary results of the Magadan experiment. The scientists' conclusion was that this innovation should be extensively adopted. Four years have gone by, and it turns out that this topic has just been placed in the scientific research plan for 1979. If the experiment continues to be "studied" at such a pace, there will scarcely be any benefit derived.

For the moment one thing is clear: the powers and authority of the engineer and the incentive of the worker should be combined in the brigade leader-foreman. In addition, he should be highly skilled in two or three related specializations, possess organizing ability and knowledge of the fundamentals of economics. The consolidated cost-accountable brigades presently need precisely such supervisors. But where can they be obtained? On this point both the supporters and opponents of the experiment are unanimous: personnel must be trained. There are many gifted brigade leaders at the construction projects, but there is no system for training them. And yet such a system is absolutely essential: the job superintendent still frequently prepares the economic contract or calculated cost for the brigade leader-foreman.

Here is a telegram which illustrates the situation: "The 'brigade leader-foreman' experiment has not been very widely adopted in the Vologdapromstroy Trust due to a limited period of operation and lack of the requisite foreman personnel capable of combining these functions. Rozov, acting trust manager."

Before beginning the experiment in Magadan, obviously all the pros and cons should have been carefully weighed. Yes, there are stable cadres at northern construction projects, but this stability is by no means due to excellent conditions and progressive organization of labor. What did USSR Mintyazhstroy do to ensure the viability of the new structure at all levels? To arrange for uninterrupted supply of this remote construction project?

Three years ago the Mintyazhstroy board approved the Magadan experiment and proposed achieving precise coordination of all elements of the experimental system, continuous-flow organization of construction, improvement in drafting of operational and long-range brigade work plans, organization of brigade leader-foreman training, and finally, changeover of all brigades to

cost accountability under their direction.... What was the result? This long list of recommendations was not carried out. And although all brigades amicably "shifted over" to economic accountability in the reports for that same Magadangorstroy Trust, in actual fact things are not that way at all.

While not totally convinced of the utility of the Magadan experiment, the ministry instructed several main administrations in Siberia, the Urals, Kazakhstan, and the Ukraine "to carry out a similar experiment" in order, on the basis of its results, "to work out the most efficient management scheme." Considerable time has passed, and yet the scheme has not yet been worked out. In addition, the procedure and conditions of the experiment have not yet been coordinated with USSR Gosstroy, the USSR State Committee for Labor and Social Problems, and the USSR Ministry of Finance, while without such coordination and agreement there will be no ratification of the status of brigade leader-foreman and wages for such a position, a statute on his authority and obligations, or training of brigade leader-foremen on a special program.

File No 26 continues to receive additional documents. I found in the file many letters with the request that construction organizations approve the position of brigade leader-foreman. USSR Mintyazhstroy, USSR Minpromstroy, and the Central Committee of the Trade Union of Workers in Construction and the Building Materials Industry prepared the latter jointly. But the ministers have not yet signed it. It was explained to me that before signing they must be at least 90% sure that this new innovation is warranted. As yet they are not entirely sure.

The recent CPSU Central Committee and USSR Council of Ministers Decree entitled "On Improving Planning and Strengthening the Effect of the Economic Mechanism on Improving Production Efficiency and Work Quality" stresses the particular significance of the brigade form of organization of labor and labor incentive, which should become the principal form in the 11th Five-Year Plan. Interest in the person of the brigade leader increases immeasurably under these conditions. What sort of a person should he be? How does he participate in production management? The work forces of construction jobs are waiting for an answer to these questions. The dragged-out Magadan experiment is also awaiting completion.

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## CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

### FULFILLMENT OF CONSTRUCTION PLAN IN BELORUSSIA REVIEWED

Minsk ZVYAZDA in Belorussian 4 Nov 79 p 1

[Article: "Construction Reserves Into Action"]

[Text] An ambitious building program is designated for the fourth year of the five-year plan. New fixed assets in this republic are to total 3,652.4 million rubles, with state capital spending of 3,260.2 million. Many construction work forces are honoring with outstanding labor achievements the 62d anniversary of the Great October Revolution and are meeting boosted socialist pledges. For example, good success has been achieved by construction workers in putting new facilities on-stream at the Mogilev Khimvolokno Production Association, on construction of the Grodno Synthetic Fibers Plant, the Luninets plant for the manufacture of electric motors for agriculture, and at other construction projects in this republic.

In the construction sector there are thousands of leading workers and production innovators, who are not only meeting plan-specified targets and socialist pledges but are also close to completing five-year plan targets.

Nevertheless, for the construction sector as a whole the situation remains disturbing as regards completion and movement on-stream of production facilities, housing, utilities, municipal and public services. In the first nine months of this year, for example, a total of 1,833.2 million rubles of fixed assets in the republic as a whole were to come on-stream, financed by state funds, or 50% of the annual target. The actual figure was 1,535.2 million rubles, which comprises 84% of the nine-month target and 42% of the year's target.

The nine-month housing construction target was not met. A total of 1,581,700 square meters of housing financed by state funds was to be completed for occupancy, but the actual figure was 1,410,000. Capital investment underspending on construction of general-curriculum schools exceeded 3 million rubles.

Such construction organizations as Trust No 35 in Minsk, trusts No 13 in Bobruysk, No 27 in Gomel', and No 4 in Minsk, Grodnopromstroy, and others



had particularly low performance figures. In order to meet the plan-specified target, organizations of the Belorussian SSR Ministry of Industrial Construction must complete almost 400 million rubles worth of construction by the end of the year, or 52% of the year's target.

All this attests to the fact that complex and responsible tasks face construction organizations. Somewhat more than a month remains to the end of the year. During this time it is necessary not only to put on-stream the plan-targeted production capacity but also to build a solid foundation for successful performance in the final year of the 10th Five-Year Plan. This can be accomplished only under the condition of a sharp acceleration in the work pace, implementation of all reserve potential, concentration of manpower and equipment on jobs to be completed this year, and precise coordination of all entities participating in construction.

Successful accomplishment of plan targets and pledges also depends in large measure on correct organization of construction activities, improved construction management, skillful utilization of equipment, and creation of conditions for high-productivity work at every work station. There still frequently occur instances where cranes, excavators, bulldozers and other equipment work only one shift. For example, in the majority of this republic's construction organizations the shift factor for earth-moving equipment is 1.1-1.2, with the standard 1.4-1.5. And yet we have considerable reserve potential for boosting labor productivity and reducing labor intensiveness. If we increase the shift factor by only 5%, for the republic as a whole we can accomplish a work volume equal to more than 35 million cubic meters. For purposes of comparison, this figure is the year's work volume for the Belorussian SSR Ministry of Rural Construction.

The practice of totaling up the results of socialist competition requires further improvement. When designating winners in labor competition, it is necessary to make a fundamental evaluation of the performance of work forces and individual workers who have average performance results, as well as those below average. It is extremely important to take measures in a flexible and efficient manner to eliminate the factors disturbing a smooth work rhythm. We must work persistently to improve moral and material incentives for competition participants and link competition closely with boosting production efficiency and excellent work quality.

Genuine success will be achieved when a single, unified construction flow is operating without interruption at all stages. And this becomes possible under the condition that all persons involved in construction -- from designers to installation and finish crews -- adopt a work completion countertarget.

Of course general contractor organizations bear principal responsibility for accomplishing the construction program. However, the client's services should be equally responsible for construction job completion. Direct obligations of the clients include precise selection of construction site and timetable, provision of thorough technical and economic substantiation, and determination of the realistic performance capabilities of



construction work forces. Their miscalculations prove very costly. It is not normal when design and estimate documentation sometimes contains numerous errors, when equipment orders and equipment deliveries are delayed, and when construction schedules frequently fail to match supply and support capabilities.

It is extremely important at the present time to concentrate manpower and resources on projects scheduled for completion this year and to set up work operations with two or three shifts. Economic executives, party and trade union committees must more vigorously incorporate advanced know-how and increase the effectiveness of socialist competition and quality of performance. We must through joint efforts secure unconditional fulfillment of the year's target as regards putting completed facilities on-stream.

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## METALWORKING EQUIPMENT

### REVIEW OF HEAVY MACHINE BUILDING

V. F. Zhigalin Comments

Moscow EKONOMICHESKAYA GAZETA in Russian No 48, Nov 79 p 2

[Article by V. F. Zhigalin, Minister of Heavy and Transport Machine Building]

[Text] Along with the successes of the sector, the deficiencies were also correctly noted in the review "Heavy Machine Building" (weekly No. 42). A number of enterprises and associations have not fulfilled the plan for nine months of 1979 in volume and nomenclature. Capacities are not being satisfactorily developed and the machine tool equipment has not been fully loaded. There are deficiencies in organization of production and labor and a significant turnover of personnel. The causes of the deficiencies were also correctly pointed out in the review.

Mintyazhmash [Ministry of Heavy Machine Building] has analyzed the results of the work of associations and enterprises of the sector and has designated specific measures to improve their activity. Attention has been turned toward the need to increase the production growth rates, to increase labor productivity and to improve the work of the material and technical supply services and cooperative deliveries and equipment to starting objects. Measures have also been provided for more intensive introduction of new technology into industry, for more complete use of equipment, development of production capacities and a reduction of personnel turnover.

The coming tasks of administrations and departments, All-Union production associations, production associations and plants of the sector in fulfilling the plan of the fourth quarter and of 1979 as a whole have been determined in the order throughout the ministry. Moreover, a number of measures is planned for implementation on realization of the 1980 plan. Specifically, a decision has been made to prepare the industry for output of products with closing of "bottlenecks" and to create additional capacities by fulfilling organizational and technical measures during the fourth quarter of 1979.

A. N. Pankov Comments

Moscow EKONOMICHESKAYA GAZETA in Russian No 48, Nov 79 p 2

[Article by A. N. Pankov, Deputy Minister of Industrial Construction of the USSR]

[Text] Correct analysis of the situation in construction of the Bezhitskiy and Kremenchug Steel Casting Plants of Mintyazhmash is given in the review "Heavy Machine Building." Disruption of the established deadlines for turnover of capacities for operation in production of steel castings was primarily the result of deficiencies in organization of construction and installation work here and poor support of the construction sites with personnel and material and technical resources.

Additional measures have now been adopted to support construction of the Bezhitskiy Steel Casting Plant with a work force. A total of 600 persons--250 more than in September--is now working on objects of the starting complex. The course of constructing the enterprise was reviewed by Minpromstroy [Ministry of Industrial Construction of the USSR], Mintyazhmash and Minmontazhspetsstroy [Ministry of Installation and Special Construction Work] of the USSR. Measures were adopted to complete construction of the first unit of the steel casting shop.

Capacities to produce 5,000 tons of steel castings annually were put into operation at the Kremenchug Steel Casting Plant. Measures are being adopted to start up the second unit of the complex. Minpromstroy of the Ukrainian SSR has already given instructions to increase the number of workers here and to support the construction sites with additional material and technical resources.

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## METALWORKING EQUIPMENT

### REVIEW OF MACHINE TOOL INDUSTRY

Moscow EKONOMICHESKAYA GAZETA in Russian No 48, Nov 79 pp 1-2

[Article: "Year Four of the Five-Year Plan for Machine Tool Building"]

[Text] A special role belongs to the machine tool and tool making industry--the key sector of domestic machine building, which is the basis of its technical equipping and re-equipping--in the decision of the tasks advanced by the 25th CPSU Congress to increase social production efficiency. The production equipment produced by this sector comprises the main part of the main production funds of machine building enterprises. An increase of efficiency and the rates of acceleration of technical progress in machine building production depend on its productivity and quality in a decisive manner.

As can be seen from the published diagram, machine tool building was developed at high rates during three years of the current five-year plan. The volume of commercial product output at enterprises of Minstankoprom [Ministry of the Machine Tool and Tool Building Industry] increased by almost 32 percent during three years. More than 569,400 metal-cutting machine tools with total cost of 4.22 billion rubles, more than 11,200 forge-press machines worth more than 1.23 billion rubles and 318.7 million rubles' worth of production equipment for the foundry industry were produced. Metalworking tools worth approximately 1.78 billion rubles were manufactured. The tasks of three years of the five-year plan were over-fulfilled in output of production equipment and diamond and abrasive tools.

The production volumes at enterprises of Minstankoprom increased by 109.9 percent in 1976, 120.8 percent in 1977 and 131.8 percent in 1978, with 1975 taken as 100 percent. It is important to note that the high growth rates of product output are accompanied by significant restoration of manufactured equipment, appreciable changes in improvement of its structure and outstripping growth of production of the most efficient equipment. These trends were also reflected in the economic indicators of sector development.

Intensive restoration of models and organization of production of more efficient and complex machines were specifically manifested in the fact

that the increase of equipment output outstripped its quantitative growth in cost (with a reduction and even some decrease of wholesale prices for serial products). Thus, the output of machine tools increased by only 3 percent in units in 1978 compared to 1975, but their total cost increased by 26 percent. Improving the structure of metalworking equipment was also reflected in increasing the fraction of forge-press machines and production equipment for the foundry industry from 26.2 percent (by cost) in 1975 to 27.3 percent in 1978.

The number of metal-cutting units with automatic and semi-automatic control reached one-fourth of the total machine tool output. The fraction of universal forging-press machines equipped with means of automation and mechanization has increased more than fivefold compared to 1975 and has exceeded 10 percent.

Production of equipment with numerical program control (ChPU) is being developed especially rapidly. A total of 12,204 metal-cutting machines and 620 forging-press machines with ChPU have been produced at enterprises of Minstankoprom during three years. The tasks provided for this period by the five-year plan have been significantly overfulfilled. The sharp increase of multioperational machine tools with ChPU, so-called "machining centers," introduction of which provides the greatest saving, is especially valuable. If the total growth of output of machines with ChPU comprised 38 percent, the number of manufactured multioperational machine tools with automatic tool replacement increased 4.4-fold and reached 215 units in 1978, while approximately 350 of these highly productive machines will be manufactured this year. It is planned to manufacture a total of 5,013 machine tools with ChPU in 1979.

The output of machine tools with ChPU by Minstankoprom was 3,638 units in 1976, 4,050 units in 1977, 4,516 units in 1978 and a planned 5,013 units in 1979.

Production of automatic manipulators (robots) with program control was begun at enterprises of Minstankoprom during the Tenth Five-Year Plan. A total of 82 of them were produced in 1978 with a planned 60 units and more than 150 have already been manufactured this year, while it is planned to bring their output up to 330 units in 1980. The fraction of high- and especially high-precision machine tools is also increasing. The task of four years of the five-year plan for this group has already been overfulfilled by 4,500 units. A further increase of product output by the machine tool and tool industry has been provided during 10 months of the current year. However, the sector is lagging somewhat behind the planned boundaries.

Progressive changes in the structure of machine tool and tool production have become possible as a result of intensive development of the production and technical base of machine tool building itself, typical for the 10th Five-Year Plan. Capacities are increasing both due to new construction and



due to reconstruction of enterprises, their technical re-equippping and improvement of the technology and organization of production.

One of the important factors of providing high rates of growth of product output is an increase of the utilization factor of existing plant capacities and also the shift coefficient of equipment operation and primarily of machine tools with ChPU.

The shift coefficient on machine tools with ChPU was a total of 1.41 throughout enterprises of Minstankoprom at the end of 1976. The shift coefficient of operating the entire stock of these machine tools (which reached almost 3,000 units throughout the sector) increased to 1.7-1.8 as a result of improving the operation of this equipment, organization of two-shift operation and of three-shift operation for unique equipment. The labor of hundreds of machine tool operators is being saved annually as a result of converting parts machining to machine tools with ChPU at enterprises of the sector.

#### To The Level of the Leaders

The machine tool builders are solving complex problems during the fourth year of the five-year plan. Production of special, specialized and unit machine tools should be increased by 3,600 units and the output of means of automation and mechanization for universal press machines should be increased by one-third. Enterprises of Minstankoprom should manufacture 90 more complete sets of automatic lines for machine building and metal-working this year than last year. Labor productivity will be increased by more than seven percent.

The results of the work of Minstankoprom during the past period of 1979 indicate that, despite a significant increase of production achieved during 10 months compared to the same period of last year, many enterprises have not reached the planned level in a number of technical and economic indicators.

A total of 119 enterprises have not coped with the tasks on output of main products in nomenclature and tens of plants have not coped with the task in product sales and an increase of labor productivity. The national economy has been short-changed with a large amount of metal-cutting machines, forging-press machines, casting equipment, metal-cutting tools and also some other types of products. Among the lagging plants are primarily enterprises of VPO, Soyuztyazhstankoprom (the chief is V. Glukharev), Soyuzstankoprom (the chief is V. Sachkov) and Soyuzkuzmash (the chief is A. Grishkov).

The All-Union production associations must adopt decisive measures to render the necessary help to the enterprises, to strengthen the discipline of cooperative deliveries and to more actively utilize the experience of leading collectives in order to eliminate the permitted lag and to provide

stable operation next year to Minstankoprom. It is the efforts of the leading enterprises that provided overfulfillment of the planned tasks by the ministry on output of machine tools with ChPU, automatic lines, consumer goods and spare parts for agricultural machines and automobiles.

The Moscow Krasnyy Proletariy Plant--the main plant of the machine tool building association--emerged as the innovator of a socialist competition in the sector at the beginning of the five-year plan under the slogan "Provide first-class equipment for the five-year plan of efficiency and quality." L. I. Brezhnev in his greetings to the collective of the enterprise highly evaluated the creative call of the Krasnyy Proletariy workers. One of the pledges of the collective was to provide output of products for the foreign and domestic market according to unified specifications, that is, according to unified technology which ensures high quality. A total of 19 models (of 24 different sizes) of machine tools is now being manufactured at the plant in this manner. More than 81 percent in the total volume of commercial product output include articles with the Badge of Quality. The collective of another capital plant--the Automatic Production Line Plant imeni 50 Letiya of the USSR--was the initiator of a socialist competition under the slogan "Provide a guarantee of quality from the design to the product." The SKB [Special Design Office] of Automatic Production Lines and Special Machine Tools and supplier plants of parts and complete sets of products and the users of the products are also participating in this movement. The fraction of products with the State Badge of Quality comprised 55 percent during the third quarter at the Plant imeni 50-Letiya SSSR. The plant is coping successfully with fulfillment of all the tasks of the 10th Five-Year Plan.

The Odessa Precision Machine Tools Plant imeni 25th CPSU Congress is fulfilling all its adopted pledges successfully. The fraction of products with the State Badge of Quality was supposed to reach a total volume of 61.8 percent in 1979. It actually comprised 69.9 percent during nine months. The use of production capacities reached a coefficient of 0.95. The shift coefficient of equipment operation of the main shops was increased. The tasks of four years of the five-year plan on the growth rates of commercial product output and labor productivity have already been overfulfilled here. The fraction of products of high category of quality in the total production volume of Minstankoprom was 10.7 percent in 1976, 15.6 percent in 1977, 24.0 percent in 1978 and a planned 31.5 percent in 1979.

It is important to universally disseminate the experience of leading enterprises. This will be especially valuable for the weakened positions and "idle" plants--the Dmitrov Milling Plant, the Sasovo Automatic Production Line Plant, the Orenburg Association Gidropress and the Pinsk Foundry Equipment Association.

#### Output of New Equipment

Being on the leading edge of the struggle to accelerate technical progress, the sector is called upon to persistently improve the level of product

output and to actively introduce innovations. The plan for development of science and technology during nine months of 1979 by enterprises, scientific and design organizations of Minstankoprom was fulfilled by 101.8 percent. However, four plants--the Novosibirsk Tyazhstankogidropress, the Minsk Plant imeni Oktyabr'skoy Revolyutsii, the Dmitrov Milling Machine Plant and the Central Volga Machine Tool Building Plant--did not overfulfill the plan in a single task. Manufacture of three adjustable series of new highly efficient machine tools with ChPU was not completed by these enterprises, while the Central Volga Plant manufactured the adjustable series of a new lathe with ChPU in incomplete volume of 41 units instead of 45.

A total of 590 experimental models, including 309 models of metal-cutting machine tools, machines and equipment and 543 adjustable series, was manufactured during three quarters. A total of 123 products of obsolescent designs was taken out of production. As can be seen, the sector planned to produce 31.5 percent of products with the badge of quality during 1979. This indicator is already equal to 31.7 percent during 10 months.

A total of 35 specialized, complexly mechanized shops and machining sections, unit assembly, painting and packing sections was organized this year in the sector. In this case 520 machine tools with ChPU was introduced. The saving from reducing the cost of product output will comprise 26.1 million rubles in 1979 due to these measures. The relative reduction in the number of workers is 12,900 persons.

At the same time, the volume of work remaining until the end of the year is still very high in the area of science and technology development. This requires that Minstankoprom, the VPO and enterprises intensify the rates of developing new types of products and introduction of progressive technology. Even more so since a lag has been permitted for some trends of technical progress. Thus, the plan of confirming state standards was fulfilled by only 30 percent by Minstankoprom during the first six months and development of CEPA standards was delayed. There are violations of the requirements of the standards and specifications at many enterprises of the sector, which leads to a reduction of product quality.

The machine tool builders need the active support of their efforts by the related enterprises that deliver the materials and complete sets of products. This is primarily true of the plants of ferrous metallurgy and the electrotechnical industry, which are still in debt to machine tool building.

Development of a joint socialist competition by the "Workers' relay-race" principle will help to ensure a further growth of output of highly efficient equipment for machine building and metalworking. It will create good prerequisites and a strong base for successful fulfillment of the tasks of the 10th Five-Year Plan by the machine tool and tool building industry.

## Progressive Methods

Minstankoprom, its associations and enterprises are now preparing to implement the decisions of the party and government on improvement of the economic mechanism. One of the most important trends of this work is strengthening of planned and contract discipline, ensuring product output within the nomenclature provided by the plan and product deliveries according to agreements and issued orders.

A volume of finished products which permits completion of railroad flat-cars, rail cars or trucks, with regard not only to the direction of the freight recipient but also of the contract deadlines of deliveries must be available at the warehouse of enterprises to fulfill the plan of product sales under the new conditions. The given circumstance is especially significant for enterprises with serial and large-series production.

An important trend in the work of Minstankoprom to improve the management mechanism is development of brigade forms of organization and payment of labor. They are encompassed by 30.2 percent of the total number of workers at enterprises of the sector. The total number of brigades was increased by 9.3 percent and now exceeds 15,000 compared to the end of 1978.

Brigade forms of organization and payment of labor are used most extensively (with 40-50 percent of the workers) at the Kholmna and Kramatorsk Heavy Machine Building Plants, the Kiev Automatic Machine Tool Plant imeni A. M. Gor'ky, the Orenburg Machine Tool Building Plant, the Ul'yanovsk Plant Gidroapparatnaya and the Izhevsk Reducer Plant. However, not all enterprises of the sector are actively introducing brigade forms of organization of labor. This work is essentially not being carried out at the Leningrad Grinding Machine Plant, the Sterlitamak and Klin Machine Tool Building Plants and the Moscow Jig-Boring Machine Plant. The corresponding regulations and methodical instructions, specifically on calculation of production plans for brigades, organization of brigades and distribution of wages in them, have been issued by the ministry for development and expansion of these forms of organization of labor in the sector.

The plan of preparation and other normative and methodological documents in the order of implementing the decree of the CPSU Central Committee and the USSR Council of Ministers dated 12 July 1978 has been confirmed. Specifically, it is planned to work out proposals by the institutes of the sector on further expansion of brigade forms of organization of labor in the sector during the first quarter of 1980. Allocation of 1-2 enterprises to each VPO for carrying out the appropriate organizing and practical work on introduction of the brigade form of organization of labor in 1980 with payment by the final product as the main product has been provided.

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## METALWORKING EQUIPMENT

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### FIFTY YEARS OF SOVIET MACHINE TOOL BUILDING

Moscow MEKHANIZATSIYA I AVTOMATIZATSIYA PROIZVODSTVA in Russian No 9, Sep 79, pp 1-4

[Article by Candidate of Technical Sciences P. A. Seravin]

[Text] By decree of the Council of Labor and Defense, the machine tool building trust--Stankotrest, which included several plants, was organized in June 1929. The Tool Trust and the Gauge-Calibration Administration were formed at the same time. This was the beginning of the development of the machine tool and tool building industry as an independent sector of the national economy of our country.

Formation and intensive development of domestic machine building is inseparably related to development and improvement of machine tool and tool building industry which provides all the machine building sectors with the means of production. The role and significance of machine tool building as the material and technical base of machine building is clearly manifested in the fact that the cost of machine tools, presses and tools in total expenditures for equipment comprises 35-50 percent in machine building.

Although the world's first turning lathe with mechanical scale slide was constructed in 1712 in our country by the prominent Russian engineer A. K. Martov, prerevolutionary Russia essentially did not have its own machine tool building. The communist party and Soviet government devoted primary attention to development of machine tool building from the first steps of socialist industrialization and at all stages of economic construction. General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet, Comrade L. I. Brezhnev in his report to the 25th CPSU Congress again emphasized that in implementation of the party's economic strategy "Special responsibility is placed on the sectors called upon to provide all spheres of the national economy with modern machines and equipment and on machine building. It is planned to increase the total volume of machine building products more than 1.5-fold during the 10th Five-Year Plan. At the same time its structure should be improved, it should become more flexible and amenable to technical innovations. This requires increased attention to development of machine tool building,



instrument building and the electrotechnical and electronics industry."\*

Because of the constant concern on the part of the party and government, our country now has the world's largest machine tool building production. Whereas 2,000 metal-cutting machines and only 100 forging-press machines were manufactured in 1929--the first year of the First Five-Year Plan, the enterprises of Minstankoprom [Ministry of Machine Tool and Tool Building Industry] alone produced 191,560 metal-cutting machines in 1978, including 4,616 machines with ChPU [Numerical program control], 38,700 forging-press machines and 473 complete sets of automatic, semiautomatic and production lines for machine building and metalworking, woodworking and casting production; metalworking and abrasive tools, production equipment and devices worth almost 880 million rubles, a large quantity of diamond tools and other products were manufactured. The volume of commercial products at enterprises of Minstankoprom exceeded five billion rubles.

The Soviet machine tool and tool building industry is today a multisector economic, scientific and technical and production complex in which more than 400 production associations, plants and their branches engaged in product output of machine tool and tool building profile and products of intersector use and also 80 scientific research, design and planning-production institutes and organizations are concentrated. The geography of machine tool and tool building production encompasses the entire territory of our country. Large machine tool building centers have been created in the Ukraine and in Belorussia, in the Lithuanian and Armenian SSRs and in other republics of the Soviet Union.

The basic production funds of the sector were increased 2.5-fold during the last 10 years. A number of new machine tool building, press building, tool and other plants, unequalled in size, has been constructed. The sector has at its disposal a unique base, without exaggeration--the gold fund of high-precision machine tool building--40 special thermoconstant shops with rigidly stable climatic conditions.

Several hundred thousand highly qualified workers, technicians, engineers, scientists and employees work at enterprises, institutes and organizations of the sector. There are 1,120 doctors and candidates of sciences among the more than 100,000 detachment of engineering and technical machine tool builders.

The plants of the sector now serially produce an enormous nomenclature--more than 300 items--of metal-cutting and woodworking machines, forging-press and casting machines for machining products of different materials with mass from several grams and in some cases fractions of grams to products whose mass reaches tens and hundreds of tons. The precision of machining on modern equipment reaches fractions of microns.

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\* Materialy XXV s"yezda KPSS [Materials of the 25th CPSU Congress], Moscow, Politizdat, p 42.

A large nomenclature of equipment is produced for use of new highly efficient production processes of machining--electrophysical and electrochemical methods, laser, beam, ultrasonic and magnetic pulse machining and many other essentially new processes which provide a sharp increase of labor productivity and quality of products produced.

ChPU and modern electronic equipment are used extensively in machine tools, machines and production equipment which make it possible to raise automation of production in machine building to a qualitatively new level. According to the decisions of the 25th CPSU Congress, the machine tool building industry is converting on ever wider scales from manufacture of individual, dispersed machines to manufacture of machine systems, automated equipment complexes and closed production sections. Two complexly automated sections of machine tools with ChPU controlled by computer for machining housing parts and types of rotating bodies have been in industrial operation for several years already at the Moscow Plant Stankokonstruktsiya of NPO ENIMS [Scientific Production Association of the Experimental Scientific Research Institute of Metal-Cutting Machine Tools]. Three more of these automated sections will become operational this year at the Jasov Automatic Production Line Plant, the Ryazan' Machine Tool Building Plant and the Vil'nyus Plant Zhal'giris.

The high rates and the achieved level of development permitted Soviet machine tool building to solve the most important national economic task--to formulate a large stock of metalworking equipment--the production-technical foundation of machine building and to provide technical equipping and re-equipping of all sectors of domestic machine building. More than 2 million metal-cutting machines, 440,000 forging-press machines and 50,000 casting machines and more than 5,500 automatic lines for machine building were supplied to the national economy during 1966-1975 alone.

Some main stages of its establishment and technical development must be noted during the anniversary year of Soviet machine tool building.

In 1931 the Leningrad Machine Tool Building Plant imeni Ya. M. Sverdlov produced the country's first heavy planing machine for machining parts with mass up to 15 tons. The Moscow Machine Tool Building Plant imeni S. Ordzhonikidze, the Gor'ky Milling Machine Plant, the Moscow Tool Plant Kalibr and the Moscow Cutting Tool Plant Frezer became operational in 1932. The country's first production of abrasive materials was organized. The first models of the Soviet massive turning lathe of the DIP family were produced at the Moscow Machine Tool Building Plant Krasnyy Proletariy. The first Soviet multiple unit machine tool was manufactured at the Plant Stankokonstruktsiya in 1934 and by the end of the 1940s Soviet machine tool building occupied one of the leading positions in the world in production of unit machine tools. The Stakhanov movement which was organized in the country in 1935 was supported by the machine tool builders. On 30 November milling machine operator, now Hero of Socialist Labor I. I. Gudov of the Moscow Machine Tool Building Plant imeni S. Ordzhonikidze fulfilled the norm by 1,430 percent.

Taking into account the needs of the vigorously developing industry, the party and government adopted a number of decrees during the pre-war years which represent a grandiose program for development of machine tool building and forging-press machine building. A total of 58,400 metal-cutting machines and 4,670 forging press machines was produced in 1940 and the output of heavy and large machine tools reached 212 units. A number of new plants and large shops became operational. However, the war unleashed by fascist Germany interfered with implementation of the intended plans.

The machine tool building plants took an active part in manufacture of various types of arms and supplied a large amount of special machine tools and machines for the needs of the military industry during World War II.

A new stage in development of machine tool building was begun during the postwar years. It was characterized not only by high rates of quantitative growth of product output (70,597 machine tools, including 2,744 precision and 8,643 special and unit machines and 7,684 forging-press machines was manufactured in 1950), but also by qualitative changes in the technical level of equipment and by radical improvement in the technology and organization of production. The first Soviet automatic production line of 14 unit machine tools was manufactured for the tractor industry in 1946 at the Plant Stankokonstruktsiya and ten sets of automatic production lines were produced in 1950. Adjustment of the complexly automated plant for production of automobile pistons was completed during the same year, where all operations, beginning from smelting the metal to packing the pistons, were performed automatically. An automatic shop was created at the same time for production of ball and roller bearings at the First GPZ [Main Bearing Plant], for which more than 570 units of different automated equipment were manufactured. Worldwide machine tool building knew of no similar examples.

Large-series boring production of the most massive types of screw-cutting machines was organized for the first time in worldwide practice at the Moscow Machine Tool Building Plant Krasnyy Proletariy.

The leading machine tool workers were lathe operator G. S. Bortkevich of the Leningrad Machine Tool Building Plant imeni Ya. M. Sverdlov, lathe operator P. B. Bykov of the Moscow Grinding Machine Plant, lathe operator V. A. Kolesov of the Central Volga Machine Tool Plant and other innovators became the initiators of the movement that achieved All-Union scope for high-speed and power methods of machining metals by cutting. This movement also gave a new impetus to the scientific and design developments in improvement of machine tools.

Development of the machine tool and tool building industry was marked in the 1960s and 1970s, according to the decisions of the 23rd, 24th and 25th CPSU Congresses, by new important scientific and technical and production achievements. Industrial production of synthetic diamonds and later of other superhard materials and cutting tools based on them has been organized

in the USSR since 1961. Extensive introduction of diamond and superhard synthetic cutting tools had a significant effect on the growth of labor productivity in metalworking--in many cases it permitted a completely new approach to construction of an entire production process for parts manufacture. Tools made of synthetic superhard materials are also used extensively with a high economic and technical effect in machining stone, construction materials, in drill bits for drilling deep wells, in the electronics industry and other sectors of the national economy.

Diamond tool production will almost double during the 10th Five-Year Plan, while tools of superhard materials will increase 2.5-fold.

The entire past decade has been noted by intensive development of equipment production with numerical program control. The first Soviet and also the world's first machine tools with ChPU were demonstrated in 1958 at the World Exhibition at Brussels, where they were awarded the gold medal. But the output of machine tools with ChPU was begun on actually wide scales during the Ninth Five-Year Plan. And now tens of thousands of these highly efficient machine tools, which provide a multiple increase of labor productivity of machine tool operators and radical improvement of working conditions which contribute to acceleration of erasing the boundaries between physical and mental labor, are now operating in industry. Unprecedented technical progress in the field of electronics technology, electric drive, measurement equipment and improvement of designs of equipment with ChPU, intensive developments and production of robots--industrial manipulators--and equipping machine tools and machines with ChPU with them open up qualitatively new capabilities for automation and an increase of the efficiency of machine tool building production. The real task of creating so-called unmanned technology in machine building on the basis of equipment with modern ChPU systems, when entire complexes of complicated machine tools will operate throughout a shift without the interference of production personnel, is coming to the forefront.

During these days the workers of the machine tool and tool building industry, inspired by the decision of the November (1978) Plenary Session of the CPSU Central Committee, regulations and conclusions outlined in the speech of General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet, Comrade L. I. Brezhnev at the Plenary Session, are persistently laboring to fulfill the tasks of the state plan of economic and social development of the USSR for 1979. Throughout the sector as a whole, the volume of commercial product output during the fourth year of the five-year plan will be increased by 10.2 percent. Further improvement in the structure of product output is being provided due to the outstripping growth rates of producing progressive types of equipment and tools which provide the greatest saving of material and labor resources in industry. Production of forging-press equipment will be increased by 11.9 percent, of automatic, semiautomatic and production lines of different production designation will be increased by 16.8 percent and that of automatic manipulators with program control will be increased by 160 percent with a growth in output of metal-cutting machines by 10.2



percent in cost. While maintaining the overall quantitative output of metal-cutting machines at the 1978 level, 12.6 percent more special, specialized and unit machine tools will be manufactured, 10.3 percent more machine tools with ChPU and 72.8 percent more multiple machine tools with automatic tool replacement will be manufactured.

During the anniversary year for the sector, production of 25 new models of machine tools with ChPU and 137 models of automatic and semiautomatic machines of all production groups must be organized. The press building plants should organize adjustable series of 43 automated complexes, new automatons and machines equipped with means of automation. A complexly mechanized milling-filing production line for simultaneous processing of logs into lumber and wastes into production chips is being developed for the woodworking industry.

Plants of the machine tool and tool building industry will continue persistent work to increase the quality of product output in 1979. The fraction of products of higher category of quality throughout the sector as a whole should be brought up to 32.5 percent compared to 23 percent of the 1978 plan and this indicator will be even higher in some VPO.

Developing and enriching the traditions of the Stakhanovites of the first five-year plans, the machine builders are even now walking in the front ranks of the leaders of the socialist competition. The well-known call of the collective of the Moscow Plant Krasnyy Proletariy--"Provide first-class equipment to the five-year plan of efficiency and quality"--received extensive support and dissemination in the sector during these years. The initiative of the Krasnyy Proletariy workers was evaluated highly in the greeting of Comrade L. I. Brezhnev to the plant collective. It said: "Your patriotic initiative, marked by a clear and understandable slogan, reflects the very essence of the main task faced by machine tool building and the entire machine building industry at the modern level of building of communism. Accelerated equipping of all sectors of the national economy with modern leading technology is the most important lever which provides a significant increase in the efficiency of social production, solution of social problems for further improvement of working conditions of millions of Soviet people and increasing the standard of living of our people" (PRAVDA, 17 January 1977).

The call of the Krasnyy Proletariy workers was picked up by the machine tool building and machine building plants of Moscow and Leningrad, Odessa and Kuybyshev. Each collective, developing this beginning, was enriched by its new ideas and slogans. The workers of the Moscow Automatic Production Line Plant imeni 50-Letiya of the USSR, the Central Volga Machine Tool Building Plant and a number of other enterprises jointly with workers of related plants, planning and design organizations and also plants operating the new equipment, advanced the requirement with the slogan: "Provide a guarantee of quality from design to product." The competing plants and organizations concluded agreements on socialist cooperation, the purpose



of which was to increase the effectiveness of progressive design solutions, to improve the technology of manufacturing highly productive machine tools and in the final analysis to increase the output of high-quality products on this equipment.

The collective of the Ivanov Heavy Machine Tool Building Plant imeni 50-Letiya of the USSR, which occupied the leading positions in development, manufacture and extensive use of complex machine tools with ChPU, manufactured a new model of a drilling-milling-boring machine with contour ChPU system, automatic tool changing and adjacent tables for continuous sequential machining of several housing parts with mass up to two tons. Introduction of the machine will provide an increase of labor productivity more than 3.5-fold and a saving of 40,000 rubles.

The workers of the Moscow Machine Tool Building Plant imeni S. Ordzhonikidze adopted a pledge to fulfill the 1979 plan ahead of schedule and to fulfill the five-year plan in production growth rates and labor productivity by the 110th anniversary of V. I. Lenin's birth. Supporting the call of the Krasnyy Proletariy workers, the plant collective planned to increase the fraction of products with the State Badge of Quality to 50 percent, including manufacture of a complex of 22 automatic production lines for KamAZ [Kama Automotive Plant] by the highest category of quality. Ten automatic production lines for machining the cylinder blocks of the engine have already been manufactured. Programmable instruction apparatus, which fundamentally simplify adjustment, maintenance and monitoring of the operation of the lines and which increase their reliability and efficiency, have been used for the first time in Soviet machine tool building practice in the control system of the indicated lines. The saving from use of these lines will comprise two million rubles annually.

Wide development of the socialist competition and high pledges of the collectives of enterprises, shops, sections, brigades and all workers of the sector who place as their goal realization of the slogan "Work without laggards," also permitted the branch as a whole to adopt intensified socialist pledges for 1979. Fulfillment and overfulfillment of the plans and socialist pledges of this year creates a reliable basis for successful completion of the tasks of the 10th Five-Year Plan--a five-year plan of efficiency and quality--by the machine tool and tool building industry.

The scientific-technical and production potential of the machine tool and tool building industry, created during 50 years of its development, the creative enthusiasm and high qualifications of the workers, engineering and technical personnel and production organizers and the rich traditions of this key sector of domestic machine building now make it possible to confidently solve the complex and diverse tasks on supplying the national economy of the country with highly efficient equipment and for implementation of the grandiose program placed before the sector by the 25th CPSU Congress.

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## METALWORKING EQUIPMENT

UDC 621.338.45

### IMPROVING THE ORGANIZATION OF EQUIPMENT REPAIR

Kiev TEKHOLOGIYA I ORGANIZATSIYA PROIZVODSTVA in Russian No 3, 1979 pp 6-8

[Article by Ye. Ya. Gusel'nikov, head of the Industrial-Transport Department of the Khmel'nitskiy Obkom of the Ukrainian Communist Party]

[Text] The stock of metalworking equipment in the USSR now comprises approximately five million units. The machine tool building industry has produced an average of approximately 264,000 units annually during the 10 th Five-Year Plan. Of this amount, approximately one-third annually is sent to replace worn and obsolescent equipment. The number of metalworking machine tools is being increased by 170,000-175,000 units annually.

However, even these rapid rates of development of machine tool building cannot meet the need for metal-cutting and forging-press equipment.

In this regard the problems of operation, modernization and repair of the machine tool stock are now very timely. The growth rates of social production, labor productivity, return of funds and quality of products produced depend largely on the level of organizing this work.

Analysis of the activity of a number of machine repair shops (RMTs) of machinebuilding plants of the oblast indicates that the complement of industrial-production personal (PPP) engaged in repair is 1.3-1.5 times higher than that engaged in main production, while at the same time labor productivity is 2-3.5 times less. The shift coefficient of equipment operation in RMTs is usually less than one, while that of special equipment operation is 0.5-0.6.

One of the reasons for the slow growth of product output per ruble of basic production funds (a stable decrease of the return of funds is observed at some enterprises) and the low shift coefficient of metalworking equipment operation in main production are deficiencies in organization of machine tool stock repair. Investigations conducted at machinebuilding plants of the oblast indicate that equipment is being repaired up to 17 percent of the allotted share of time instead of the optimum 5-7 percent.

Significant improvement of repair work is possible by organizing centralized major overhauls of all metalworking equipment. Expenditures for major overhaul in a machine building plant and at specialized repair enterprises of the Soyuzstankoremont Association are presented in the table.

Actual Expenditures for Major Overhaul of  
Universal Equipment per Unit of Repair Cost

Name of Enterprise	At RMTs of Enter- prises, norm-hr	At Special- ized Repair Plant Soyuzstanko- remont, norm-hr	At RMTs of Enter- prises, rubles	At Special- ized Repair Plant Soyuzstanko- remont, rubles,
Kamenets-Podol'sk Instrument Building Plant	39.5	19.2	55.5	26.5
Krasilov Machine Building Plant	57.0	24.7	66.3	31.4
Gorodok Machine Tool Building Plant	35.0	23.5	49.0	31.2
Khmel'nitskiy Asso- ciation for Produc- tion of Forging- Press Equipment	43.1	24.7	38.0	23.0

As can be seen from the table, repair at specialized plants of the Soyuzstankoremont Association is 1.5-2 times less expensive. All machine tools essentially have their initial certified specifications after repair.

However, several five-year periods are required to organize centralized major overhaul of all metalworking equipment, as indicated by practice. Therefore, important attention must be devoted to improving repair locally, to accelerated introduction of the achievements of scientific and technical progress and to specialization of machine repair subdivisions within the plant, city and oblast.

There are two systems of production equipment maintenance--centralized and mixed--at machine building plants of the oblast. The most effective under conditions of associations and large plants is the mixed system in which major overhauls and medium repairs of all types of metalworking machine tools and other equipment are made in a specialized machine repair shop, while all remaining operations, including maintenance between overhauls,

are carried out by the shop repair services which are subordinate to the chief engineer.

The centralized maintenance system is used extensively at small plants with up to 1,000 units of production equipment.

The types and models of equipment, on the basis of which the consolidated repair brigades were created, were analyzed for specialization of repair brigades at RMTs of the transformer substation plant. Production processes and repair norms and also instructions for restoration and strengthening of worn parts and for methods of adjusting complex machine tool subassemblies were developed for each type of machine tool.

Typical production processes for equipment repair were developed at most machine tool plants of the oblast, which are supplied with special repair and monitoring-checking equipment and normalized monitoring equipment and devices.

Further improvement of the technology and organization of equipment repair must be carried out in the following directions:

- specialization of machine repair shops within the city, oblast and sector;

- standardization and centralization of repair and monitoring-checking equipment manufacture by production processes unified in all the machine building ministries;

- further intrasector specialization and intersector cooperation in production of spare parts, unstandardized equipment and means of mechanization used at repair shops;

- expansion of scientific research work on complex planning of organization, technology and economics of repair work.

Implementation of these and other measures will be an important contribution to further development of industrialization of metalworking equipment repair in our country and to the matter of intensifying the use of the machine tool stock and of increasing the return of basic production funds.

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## METALWORKING EQUIPMENT

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### EQUIPMENT RESTORATION AS A FACTOR INCREASING PRODUCTION EFFICIENCY

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[Text] The scales of technical re-equipping and reconstruction of existing enterprises have increased significantly during the past few years in the machine building and metalworking sector of the republic, which has had a positive effect on increasing the efficiency of social production. However, the shift coefficient of equipment operation is at the 1965 level at many enterprises and comprises an average of 1.4-1.45, while a trend toward a decrease of this indicator has been noted at some enterprises (for example, the machine building plants of the southern economic region).

One of the factors which delays an increase of the shift coefficient is the nonconformity of the production equipment stock to modern production requirements. A large amount of morally and physically obsolescent machine tools (more than 20 years old) is being operated at many enterprises. For example, more than 30 percent of obsolescent machine tools are in operation at the Khar'kov Plant Elektromashina, the Dnepropetrovsk Heavy Press Plant and others.

Obsolete equipment is considerably inferior in productivity to modern equipment, its operation is of low efficiency and leads to a decrease of the rates of technical progress in the national economy. A large number of machine tool operators and repairmen are engaged in maintenance of morally and physically obsolescent equipment.

Comparison of the technical-economic indicators of machine tools of different age groups of the same type (up to 10 and more than 20 years old) shows that machine tools operated more than 20 years have a typical decrease of productivity of 22-40 percent, an increase of major overhaul expenses by 20-25 percent and a reduction of the operating time between major overhauls of 17-20 percent.



Along with this, the possibilities of introducing new production processes are limited when obsolescent equipment is operated, obsolete forms of organization of labor are used and the use of the entire production stock of machine tools is not being improved.

A tendency toward an increase of the basic production funds and accumulation of obsolescent equipment has been observed during the past few years at many machine building enterprises. Thus, more than 40 percent of the basic production funds were introduced at many machine building enterprises while approximately eight percent were taken out of operation. Accordingly, the active part of the basic production funds is also being restored at an increased rate.

Analysis of data on equipment restoration at some machine building plants of the Ukrainian SSR shows that the average cost per year is 10.1 percent, while only 2.86 percent of equipment is taken out of operation, which is one of the main causes of a decrease of the return of funds. The ratio on the amount of equipment replaced is also unsatisfactory: an average of 6.45 percent is introduced and only 3.4 percent is taken out of operation. This leads to accumulation of obsolescent machine tools, as a result of which incomplete supply of enterprises with operating machine tools is increasing.

Machine tool models are replaced approximately every 7-8 years and in this case the machine tool productivity increases an average of 25-30 percent. When a machine tool having an age of more than 20 years is replaced, the labor productivity of the new model of machine tool is increased by a factor of 1.5-2 since 2-3 models of machine tools are replaced. In this case 1 percent of the new equipment permits a release of not less than 1.5 percent of obsolescent equipment without a reduction of production capacities. However, this circumstance is not taken into account by the enterprises. For example, 4.7 percent of new equipment was put into operation and 1.8 percent of obsolescent equipment was taken out of operation in 1977 at the Khar'kov Electromechanical Plant.

The need for machine tool operators has increased by 4 percent with significant replacement of obsolescent equipment and shift coefficient of 1.4. If 7 percent of the obsolescent equipment is taken out of production, approximately 3 percent of machine tool operators, as a result of which the shift coefficient of equipment operation can be increased.

Thus, replacement of obsolescent equipment with new, more productive equipment will make it possible to increase labor productivity, the quality of product output, the shift coefficient of equipment operation, the return of basic production funds and a saving during major overhaul and current repairs, which will contribute to a significant degree to increasing the efficiency of the machine building industry.

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